DOCUMENT RESUME

ED 084 002 PS 006 629

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TITLE	Follow-Through Project, Health-Education-Welfare Fund (Fund Number 88-1). 1971-1972 Evaluation.
INSTITUTION	Cleveland Public Schools, Ohio. Div. of Research and Development.
SPONS AGENCY	Office of Education (DHEW), Washington, D.C.
PUB DATE	Mar 73
NOTE	193p.
EDRS PRICE	MF-$0.65 HC-$6.58
DESCRIPTORS	*Classroom Environment; *Compensatory Education Programs; *Elementary School Students; *Evaluation; Individualized Instruction; *Preschool Programs; Socioeconomic Influences; Teacher Influence
IDENTIFIERS	Cleveland Public Schools; *Project Follow Through

ABSTRACT

The 1971-72 evaluation report of Project Follow Through in the Cleveland public schools focuses on the following issues: (1) degree to which product objectives at each grade level were attained, (2) degree to which such factors as project participation, teacher, preschool experience, and socio-economic factors influenced children's performance, (3) what other factors had important influences, and (4) degree to which the principles of the responsive classroom environment were evident in the classrooms. The Follow Through Project in Cleveland provides a comprehensive program of instruction and supportive services for 4 1/2 years. The instructional approach, Responsive Classroom Environment, is characterized by individualized instruction, free exploration, immediate feedback to children about the consequences of their actions, self-pacing and child orientation, and structure designed to facilitate interconnected discoveries by the learner. The project served a total of 466 children during the '71-'72 year in Cleveland. Major evaluative findings are presented, and recommendations for the program are discussed. (DP)

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FOLLOW-THROUGH PROJECT
HEALTH-EDUCATION-WELFARE FUND
FUND NUMBER 88-1
1971-1972 EVALUATION

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March, 1973

PS 006629

THE 1971-1972 EVALUATION REPORT OF PROJECT FOLLOW-THROUGH WILL ATTEMPT TO RESPOND TO THE FOLLOWING QUESTIONS:

1. TO WHAT DEGREE WERE THE PRODUCT OBJECTIVES AT EACH GRADE LEVEL ATTAINED?

2. TO WHAT DEGREE DID SUCH FACTORS AS PROJECT PARTICIPATION, TEACHER, PRESCHOOL EXPERIENCE, AND SOCI-ECONOMIC FACTORS, EXERT ANY INFLUENCE ON CHILDREN'S PERFORMANCE AT EACH GRADE LEVEL?

3. WERE THERE FACTORS OTHER THAN THOSE INDICATED, WHICH DEMONSTRATED SOME INFLUENCE ON CHILDREN'S PERFORMANCE?

4. TO WHAT DEGREE WERE THE PRINCIPLES OF THE RESPONSIVE CLASSROOM ENVIRONMENT EVIDENT IN THE CLASSROOMS?

FOLLOW-THROUGH PROJECT

I. INTRODUCTION

> "....Head Start occupies only a part of a child's day and ends all too soon. He often returns home to conditions which breed despair. If these faces are not to engulf the child and wipe out the benefits of Head Start, more is required. Follow-Through is essential....the benefits of Head Start must be carried through the early grades."
>
> President Lyndon B. Johnson
> February 1967
> Message to Children's Youth to Congress

A. Needs and Rationale

The controversy over the sustained value of preschool experiences has been well documented. But few will deny that children with preschool experiences enter school better prepared to meet the challenge of the classroom. Through preschool experiences, children who have been deprived educationally and economically, have moved beyond their neighborhoods, many to visit for the first time a museum or a zoo. They have had health checkups their parents could not afford. Nutrition, psychological, social work, and speech therapy services have contributed to alleviate impediments to learning. Unless that child with preschool experiences continues to receive special attention, he is likely to lose all that he has gained. Follow-Through is essential.

The 1971-1972 Follow-Through Project of the Cleveland Public Schools continues to provide for four and one-half years a comprehensive program of instruction and supportive services in medical, psychological, social, nutritional, dental, and speech areas. Although the aims are not too different from Title I programs designed for the poor in terms of raising levels of aspiration, improving self-concept, etc., the Project has other crucial objectives such as:

- Individualized instruction which builds upon listening and speaking skills.
- An uninterrupted experience which builds on the preschool experience.
- Meaningful parent participation.
- Maximum use of neighborhood schools and other community resources.
- Continuous training for professional and paraprofessional staff.
- Evaluation designs that assess the growth of children and overall program effectiveness.

Project Follow-Through focuses on the total needs of each child, thus requiring a comprehensive, yet individualized approach to learning. It calls for an interdisciplinary approach which provides services in the areas of health, nutrition, social services, and psychology to support an individualized program of instruction.

Classroom instruction is based on the Responsive Classroom Environment developed by the Far West Educational Learning Laboratories, Berkeley, California. The approach organized the classroom and ongoing instructional processes as "autotelic responsive environment" characterized by the following:

- It permits the learner to explore freely.

- It informs the learner immediately of the consequences of his actions.
- It is self-pacing and child-oriented.
- Its structure is such that the learner is likely to make a series of interconnected discoveries.

The integration of comprehensive supportive services into the total program represents efforts to look beyond the immediate classroom to the many environmental factors which affect learning. In addition, heavy emphasis is placed on parent involvement. To create the unity of learning which occurs in and out of the classroom, parents are brought closer to the learning process in order to stimulate their children to learn at home. Teachers are asked to explain to parents what they are doing or accomplishing. Given insight into the educational processes and involvement in the learning experiences of the children, they may become skilled in fostering the intellectual, emotional, and social development of their children.

The product objectives by grade were as follows:

Kindergarten

1. Kindergarten Follow-Through children will show higher level of reading readiness skills ($p < .05$) than an appropriate comparison group at the end of the 1971-1972 school year, as evidenced by scores obtained on Metropolitan Readiness Tests.
2. Kindergarten Follow-Through children will show more positive self-concept than an appropriate comparison group at the end of the 1971-1972 school year, as based on scores obtained on a test of self-concept, on teachers' ratings, and parents' reports.

3. Kindergarten Follow-Through children will show higher attendance ($p < .05$) than an appropriate comparison group during the 1971-1972 school year.

4. Kindergarten Follow-Through teachers will evidence higher ratings on a locally-devised Responsive Classroom Observational Rating Scale at the end of the year compared to observed ratings at the beginning of the year.

First Grade

1. First Grade Follow-Through children will show higher level of basic achievement skills in reading and arithmetic ($p < .05$) than an appropriate comparison group at the end of the 1971-1972 school year, based on scores obtained on standardized test measures.

2. First Grade Follow-Through children will show more positive self-concept than an appropriate comparison group at the end of the 1971-1972 school year, based on scores obtained on a test of self-concept, on teachers' ratings, and parents' reports.

3. First Grade Follow-Through children will show higher attendance ($p < .05$) than an appropriate comparison group during the 1971-1972 school year.

4. First Grade Follow-Through teachers will receive ratings on a locally-devised Responsive Classroom Rating Scale which will be directly proportional to the number of years of experience in the Project.

5. Duration of Follow-Through participation from kindergarten through first grade will show significant positive effects on basic reading and math skills and self-concept measures at the end of the school year.

Second Grade

1. Second Grade Follow-Through children will show higher level of basic achievement skills in reading and arithmetic ($p < .05$) than an appropriate comparison group at the end of the 1971-1972 school year, based on scores obtained on standardized test measures.

2. Second Grade Follow-Through children will show more positive self-concept than an appropriate comparison group at the end of the 1971-1972 school year, as based on scores obtained on a test of self-concept, on teachers' ratings, and parents' reports.

3. Second Grade Follow-Through children will show higher attendance ($p < .05$) than an appropriate comparison group during the 1971-1972 school year.

4. Ratings of Second Grade Follow-Through teachers on a locally-devised Responsive Classroom Rating Scale will be directly proportional to the number of years of experience in Second Grade Follow-Through Project.

5. Duration of Follow-Through participation from kindergarten through third grade will show significant positive effects on basic reading and math skills and self-concept measures at the end of the school year.

Third Grade

1. Third Grade Follow-Through children will show higher level of basic achievement skills in reading and arithmetic ($p < .05$) than an appropriate comparison group at the end of the 1971-1972 school year, based on scores obtained on standardized test measures.

2. Third Grade Follow-Through children will show more positive self-concept than an appropriate comparison group at the end of the 1971-1972 school year, as based on scores obtained on a test of self-concept, on teachers' ratings, and parents' reports.

3. Third Grade Follow-Through children will show higher attendance ($p < .05$) than an appropriate comparison group during the 1971-1972 school year.

4. Third Grade Follow-Through teachers will receive ratings on a locally-devised Responsive Classroom Rating Scale which will be directly proportional to the number of years of experience in the Project.

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5. Duration of Follow-Through participation from kindergarten through third grade will show significant positive effects on basic reading and math skills and self-concept measures at the end of the school year.

The following process objectives will guide the 1971-1972 Project operation:

1. Classroom instructional strategy from kindergarten through third grade will be based on the Responsive Environment Principle: self-pacing, free exploration, discovery learning, self-rewarding activities, etc.

2. Classroom activities from kindergarten through third grade will be organized in a manner which will allow children to experience feelings of success and mastery.

3. Classroom activities from kindergarten through third grade will be carefully planned and structured which will allow children a variety of alternatives in their self-paced or self-initiated learning.

4. Opportunities will be created in the classroom from kindergarten through third grade for the development of the senses, perceptions, language concept formation abilities, and other component skills of cognition.

5. Opportunities will be created in the classroom from kindergarten through third grade for developing children's ability to "learn how to learn," or problem-solving skills.

6. An eclectic reading approach, based on a combination of elements of LEIR program and those of other reading strategies which strengthens and reinforces children's decoding skills will be explored and utilized at grades 1, 2, and 3.

7. Follow-Through teaching staff will be involved in a one-to-two hour weekly in-service session during the 38-week school year and will be directed towards the following topics:

   - Basic understanding of the components of the Responsive Environment Principle.

   - Development of new techniques, based on the Responsive Environment Principle.

- Communication of new events obtained from training sessions conducted by the Model Sponsor to the staff.

- Communication to staff of parent's expectations, questions, etc.

- Discussion of in-service training units provided by the Model Sponsor to teachers and teacher assistants and their integration into the actual teaching.

- Feedback of evaluation test data at the local, at the Model's level, and their interpretation.

- Discussion of explicit curricular goals and objectives at the three grade levels.

- Discussion of varied reading program for purposes of identifying components which reinforces decoding skills.

8. Teachers will continue to explore ways to reorganize subject matter presentations along sequential behavioral units, based on the Responsive Environment Principle.

9. New and creative strategies of parent involvement in school and community activities will be explored and developed.

10. Comprehensive medical-dental-psychological, and social work services will be continued.

11. Fourth-grade classroom teachers of previous Follow-Through children will be involved periodically in in-service sessions during the 1971-1972 school year, and will be directed at the following topics:

    - Basic understanding of the components of the Responsive Environment Principle and their implementation at first, second, and third grades.

    - Discussion of expected behaviors of Follow-Through children, in terms of their strengths and deficits in basic achievement skills.

B. Historical Background

The Cleveland Follow-Through Project at Mary B. Martin School was created in January 1968 under the HEW Office of Education. In its first four and a half months of operation, the Project was limited only to kindergarten children, but expanded in subsequent school years to include gradually first, second, and third grade. During the 1968-1969 school year, Project Follow-Through served both kindergarten and first grade children; during the 1969-1970 school year, it served kindergarten, first, and second grade children; during the 1970-1971 school year, it provided services to kindergarten, first, second, and third grade children. In the 1971-1972 school year, a total of approximately 400 children from kindergarten through third grade participated in the Project. In addition, 66 fourth grade children received limited Project services through participation of their classroom teachers in regular in-service sessions conducted by Project Follow-Through. The Project operation has expanded over a 4 1/2 year period, from three kindergarten classes in 1968 to 16 classes during the 1971-1972 school year.

Project Follow-Through was funded from three sources: Follow-Through funding, Title I matching funds as well as non-federal (State and local) monies. During the 1971-1972 school year, Title I funding as well as local (or State) monies constituted 37% of the total Follow-Through funding, with 17% noted for Title I, and 20% for non-federal (local-State) contributions.

The present matching funding appeared to depart slightly from previous years when 15% Title I and 25% non-federal funds were required for matching Follow-Through monies.

Previous assessment of Project operations indicated improving level of achievement over a four and a half year period. The following key findings were summarized from previous evaluation reports.

- With increasing experiences in implementation of Follow-Through Project, level of achievement of Project participants showed gradual improvement in achievement. Thus, the first group of Project participants in 1968 appeared to show lower level of achievement than did the succeeding group of participants.
- Follow-Through children consistently showed higher level of attendance than did the control groups across all grade levels.
- Duration of Follow-Through participation consistently showed no impact on achievement.
- Teacher competencies in implementations of process components of the Responsive Environment Principle tended to improve with increasing experiences.

C. Summary of Operations

Project Follow-Through served a total of 466 children during the 1971-1972 school year. Four hundred of these children received complete Follow-Through services, as they were attending kindergarten, first, second, and third grade classes. The remaining 66 received very limited services through participation of two classroom teachers in Follow-Through in-service and workshop sessions. Average daily membership for Follow-Through participants from kindergarten through third grade was estimated at

379 pupils. Average daily membership of fourth grade pupils who received limited services was estimated at 62 pupils.

The total expenditure amounted to $446,381.79. This cost represented money from three funding sources, with distribution as follows:

Follow-Through Funding (EOA)	$338,638.99
Title I	40,427.80
Non-Federal (State and Local)	35,955.00[1]
Total	$415,021.79

The per-pupil cost for full time participants was estimated at $1,092, based on average daily membership of 379 children.[2] The per-pupil cost of $20 for each fourth grade child was maintained. The indicated costs represent expenditure beyond the $225.00 per-pupil expenditure for maintenance of local efforts among full-time Follow-Through participants.[3] Among fourth grade participants, the total cost (general and Follow-Through funding) amounted to $523.77.[4]

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[1] The proposal indicates a non-federal contribution of $67,315.00. However, almost half of this money, estimated at $31,360.00 represented a monetary value of 65 volunteers' time. This was eliminated from this report to avoid confusion.

[2] The $20 per-pupil cost of fourth grade pupils with limited Follow-Through services was subtracted from the total amount when the per-pupil cost for full-time participants was estimated.

[3] The $225.00 per-pupil maintenance of efforts cost was based on the total maintenance of efforts cost of $168,670 (1971-1972 Proposal Budget) and a total enrollment of 750 pupils at Mary B. Martin School. The usual per-pupil expenditure cost was not utilized in this report because the Follow-Through Project represents a total package.

[4] Per-pupil cost expenditure of $503.77 was estimated for elementary pupils, based on the 1971-1972 Educational Expenditure Per-Pupil released by the Office of Clerk-Treasurer.

II. HIGHLIGHTS OF FINDINGS

A. Summary of Key Findings

1. Project Follow-Through appeared to be most effective at kindergarten and at first grade, and least effective at second and third grades during the 1971-1972 school year. Follow-Through children evidenced significantly higher level of basic readiness and achievement skills than did control children at kindergarten to first grades. At grades two to three, control children continued to demonstrate significantly higher level of performance than did Follow-Through children[1] (Table A).

TABLE A

SUMMARY OF ATTAINMENT OF PRODUCT OBJECTIVES RELATIVE TO ACHIEVEMENT, SELF-CONCEPT AND ATTENDANCE BY GRADE

Group Comparison	Dependent Variable	Group Holding Advantage	Product Objectives[1]		
			No.	Attained	
				Yes	No
Kindergarten Follow-Through Vs. Control	Metropolitan Readiness	Kindergarten Follow-Through	3	X	
	Stanford Early School		1	X	
	Self-Concept Rating		2	X	
	Attendance		3	X	
First Grade Follow-Through					
Vs. Control 1 Vs. Control 2	Stanford I: Reading-Math	First Grade Follow-Through	1	X	
Vs. Control 1	Self-Concept Rating	No difference	2		X
Vs. Control 2		Control 2	2		X
Vs. Control 1 Vs. Control 2	Attendance	No difference	3		X
Second Grade Follow-Through Vs. Control	Stanford II - Reading	Control	1		X
	Stanford II - Math	No difference	1		X
	Self-Concept Rating	No difference	2		X
	Attendance	Control	3		X
Third Grade Follow-Through Vs. Control	Stanford II - Reading - Math	Control	1		X
	Self-Concept Rating	No difference	2		X
	Attendance	No difference	3		X

[1] Refer to pages 3-6 for the product objectives listed by grade.

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[1] Comparability of Follow-Through and control schools was based on Poverty, Mobility, and Achievement indices. Poverty index represents a gross measure of socio-economic patterns of children attending a particular school. Mobility index represents a gross measure of the number of school transfers made in a year.

The superior performance of Kindergarten and First Grade Follow-Through children over the control groups represents increasing effectiveness of this program over four to four and a half years of Project operation. In the past (during the school years January-June 1968, 1968-1969, and 1969-1970), control children had always demonstrated significantly higher level of performance than did Kindergarten Follow-Through children until the 1970-1971 school year, when the trend was reversed. Kindergarten Follow-Through children then evidenced significantly higher level of readiness skills than did the control groups for the first time in three and a half years. The trend was continued to the current school year. The significantly higher level of performance of First Grade Follow-Through children over the control group during the 1971-1972 school year occurred for the first time in four years of implementation of First Grade Follow-Through Project. However, trends reflecting lower performance of Follow-Through children when compared to control children at second and third grades noted in previous years, appeared to be continuing.

2. Differences attributed to teacher factor appeared to transcend differences attributed to treatment (school) effects. Analysis of teacher comparisons within each treatment (school) revealed 15 out of 19 teacher comparisons were highly significant ($p < .05$ to $p < .0001$).

   a. At kindergarten, teacher comparisons within Follow-Through and control school were significant.

   b. At first grade, teacher comparisons at Follow-Through and the two control schools were highly significant.

c. At second grade, two out of three teacher comparisons in Follow-Through school, and two teacher comparisons in control school were highly significant.

d. At third grade, differences between the three Follow-Through teachers were non-significant, while the two teacher comparisons within the control school were significant.

These findings suggest that teacher differences have as great an impact on children's performance as participation in a Follow-Through or non-Follow-Through program. They suggest the need to re-examine variables relative to teaching behaviors presently unknown which appear to have a marked influence on children's performance.

3. Duration of Project teaching experience did not show any consistent relationship with mean ratings received on a locally-devised seven-point rating scale completed by the Project administrative staff. High correlations were noted between duration of Project experience and mean ratings for kindergarten teachers. Correlations ranged between .10 to .20 for Follow-Through teachers at first to third grades.

These findings indicated that the indicated product objective was attained only in one out of four grades: Follow-Through teachers will receive ratings on the Responsive Classroom Rating Scale which will be directly proportional to the number of years of Project teaching experience.

4. Duration of Project participation evidenced no impact on achievement and self-concept measures at the end of the school year in three out of four grade levels. The significant positive influence of duration of Project participation was limited only to arithmetic computational skills and self-concept measures of Second Grade Follow-Through children.

These findings indicated that attainment of the following product objective was limited only to Second Grade Follow-

Through children on selected measures: *Duration of Follow-Through participation will show significant effects on basic reading-mathematics skills and self-concept at the end of the school year.*

5. Exploratory studies of former Follow-Through pupils in 'transition' attending *regular* fourth grade classes at Mary B. Martin School, compared with fourth-grade pupils with no similar experiences from two non-Follow-Through schools indicated the following findings:

   a. Differences in basic achievement skills, self-concept ratings and attendance were not significant when 'in transition' children were compared with regular fourth grade children from a non-Follow-Through school (Control 1) comparable to the Follow-Through school in poverty and in mobility indices.

   b. Overall group difference was significant (Multivariate $F = 2.23$, $p < .05$) when comparisons were made between the children 'in transition' and Control 2 or regular fourth grade children. Control 2 children were attending non-Follow-Through schools which were better socio-economically than the Follow-Through school, based on lower poverty and lower mobility indices. Performance on CTBS Arithmetic Concepts represented the most significant difference between the two groups and contributed to the overall group difference:

      - Children 'in transition' were functioning at 3.3 grade level as compared to Control 2 children who were functioning at 4.3 grade level at the end of fourth grade.

      - Children 'in transition' were functioning at 2.5 grade level as compared to Control 2 children who were functioning at 3.2 grade level in the early part of third grade (November 1970).

   Findings from these exploratory studies represented trends similar to earlier studies of the same three groups at kindergarten through third grade.

6. A follow-up of Follow-Through and control pupils at two grade levels indicated significant differences in favor of second grade controls at the end of the 1970-1971 and 1971-1972 school years. However, differences did not meet significance in the follow-up of Third Grade Follow-Through and control pupils (Table B).

TABLE B

SUMMARY OF FOLLOW-UP STUDIES OVER A TWO-YEAR PERIOD, 1970-1971, AND 1971-1972 SCHOOL YEAR

Follow-Up Studies By Year	Dependent Variable	Group Holding Advantage
Second Grade Follow-Through Vs. Controls		
1970-1971	Stanford I Reading Stanford I Math	Control No Difference
1971-1972	Stanford II Reading Stanford II Math	Control No Difference
Third Grade Follow-Through Vs. Controls		
1970-1971	Stanford II Reading Stanford II Math	No Difference No Difference
1971-1972	Stanford II Reading Stanford II Math	No Difference No Difference

a. Second Grade Follow-Through Vs. Controls

- At the end of first grade (May 1971), control children evidenced significantly higher level of performance ($p < .01$) than did the Follow-Through children, on two (Paragraph Meaning and Word Reading) out of three Stanford I Reading subtests. A year later (May 1972), the same control group evidenced significantly higher level of performance ($p < .01$) than did the Follow-Through group on the Stanford Paragraph Meaning subtest only. Thus, differences between these two groups noted at the end of second grade, did not appear to be as great as differences noted a year earlier.

b. Third Grade Follow-Through Vs. Controls

- Overall group differencesbetween these two groups were not significant at the end of the second and third grades

These findings suggest that the consistent superior performance of controls over the Follow-Through children observed in the past (refer to previous evaluation reports) was not maintained over time. These findings may be a function of introducing 'structure' into what has been a relatively fluid and unstructured program change in Project administration, differences in program emphasis, etc.

7. The influence of preschool experience on basic achievement skills, attendance and self-concept ratings, failed to reflect a consistent trend. This finding may be a function of several factors including:

   a. Preschool experience is not unitary as it interacts with a variety of school and non-school experiences. The more remote the experience is, the more difficult it becomes to attribute anything to such experience as they become compounded by other variables.

   b. Learning is not a function only of the interaction between children and teacher, it is a process that is going on between children themselves, as well as between children and the outside world.

8. Analysis of variables influencing achievement and self-concept of Follow-Through children at the end of the school year, kindergarten through fourth grade, indicated that teachers' initial self-concept ratings of participants, represented the best predictor of performance. Self-concept ratings showed a positive and direct relationship on performance: The higher the initial ratings, the higher was the performance level. Other key findings were noted:

    a. Duration of Follow-Through participation evidenced no influence on achievement or self-concept except at second grade.

    b. Attendance and chronological age hardly showed any impact on performance.

    c. PLR scores (Kuhlmann-Anderson) appeared to be the best predictor of achievement and self-concept when available.

    d. Selected pre-test measures were also found to be good predictors of children's performance.

Findings from item number 8 suggest that the time of the data collection may determine the degree of impact of such data on performance. The more recent the test data, the higher are the probabilities of its significant impact; the more remote the test data, the less are the probabilities of demonstrating a significant influence. The recency of initial self-concept ratings, pre-test measures, and PLR scores may account for its consistent significant effects on performance. Similarly, the effects of Metropolitan Readiness Tests total scores (obtained at kindergarten) were only found to be significantly predictive of performance at first grade. Its influence became less evident, however, at the upper primary levels.

9. Ratings of Follow-Through teachers by the Project administrative staff on a seven-point Responsive Classroom Observation Rating Scale indicated implementation of the Responsive Principle with the more 'responsive' classroom behaviors at kindergarten with the less responsive classroom behaviors at first grade. The following key findings were noted:

   - Utilization of the Language Experiences in Reading approach decreases as one goes up the grade level.
   - Degree of teacher's verbal demeaning behavior appeared to be strongly correlated with application of strong physical force to insure classroom control.

10. Relationships between mean ratings received and class achievement from kindergarten to third grade, were not evident.

These findings suggest that other critical variables affect classroom achievement other than the degree of implementation of 'Responsive' classroom environment principle, or the duration of Project-teaching experience. These findings further suggest the need to re-examine those variables presently unknown which are affecting classroom performance.

B. Implications and Recommendations

Project Effectiveness and Achievement: Project Follow-Through appeared to be most effective at kindergarten and first grade, and least effective at the upper grade levels. At the two lower grade levels, Follow-Through children evidenced a higher level of basic readiness and achievement skills than did the control children. At the upper grade levels (grades 2 through 4), control children tended to show significantly higher level of performance than did Follow-Through children.

The superior performance of Kindergarten and First Grade Follow-Through children over the control groups alluded to, represents increasing effectiveness of this program over four to four and a half years of Project operation. In the past (during the school years January-June 1968, 1968-1969, and 1969-1970), control children had always demonstrated significantly higher level of performance than did Kindergarten Follow-Through children until the 1970-1971 school year, when the trend was reversed. Kindergarten Follow-Through children then evidenced significantly higher level of readiness skills than did the control groups for the first time in three and a half years. The trend was continued to the current school year. The significantly higher level of performance of First Grade Follow-Through children over the control group during the 1971-1972 school year occurred for the first time in four years of implementation of First Grade Follow-Through Project. The implication from these findings appears to be that continuing implementation will result in increasing Project effectiveness to affect achievement and readiness skills, with increasing understanding of the theory underlying the 'Responsive' classroom environment with increasing experience in its implementation. It should be noted, however, that the Responsive Environment Principle as presently implemented, has undergone several modifications introduced at the local level. Some structure has been added to what has been considered 'too open' or 'too unstructured' approach of the Responsive Principle in an effort to make it more relevant to the local needs. It is highly probable, therefore, that the increasing effectiveness of this Project may be a function of the local impact to the Responsive classroom environment, rather than the sole influence of the responsive approach.

Trends reflecting lower performance of Follow-Through children when compared to control children at second and third grades appeared to be continuing. Product objectives relative to achievement, self-concept, and attendance were hardly attained this year as in the previous years. These trends may be a function of children's earlier exposure to a program in its early developmental phase. The Responsive program then, two years ago, was operating in a random trial-error fashion, with its share of problems which are usually associated with pilot programs in its initial year of operation. Or, the poor observed performance may be a function of children's earlier exposure to a totally 'unstructured' or 'too open' approaches, primarily diverted at developing their self-concept.

Follow-Up Studies and Achievement: The superior performance of control children over Follow-Through children at grades 2 and 3 during the 1971-1972 school year (see pages 12-13) was not always verified by the follow-up studies. A two-year follow-up of controls and Second Grade Follow-Through children indicated that although the controls showed significantly higher level of achievement at the end of the second year, differences were not as great as those observed a year earlier. A two-year follow-up of Third Grade Follow-Through and control children indicated that differences at the end of second grade and at the end of third grade were non-significant. Group differences which consistently favored the controls in the past appeared to have disappeared over time.

Findings from these follow-up studies may be a function of many factors occurring during the 1971-1972 school year. The most obvious was the change in administration of Project Follow-Through. This change at the top heralded other equally important changes most evident in program structure, program emphasis, and in staff receptivity to ideas. A structure was introduced into what has been generally fluid, open, and very unstructured program, although the general intent of the responsive program structure was maintained. Awareness of building up the child's self-concept continued to be the focus of the program, but not at the expense of ignoring such basic skills as reading at grades 1 to 3. The child's curiosity, his capacity to learn, and interest were utilized as a media on which to provide individualized classroom instruction, but teachers assumed a more active role in guiding learing activities for acquisition of basic skills. The Model's basic reading approach, Language Experiences in Reading, for example, was supplemented with other reading approaches at the discretion of the teacher involved. Teaching staff's reactions to the change in administrative set-up was very positive. A rapport established between Project administration and teaching staff, no doubt resulted in greater cooperation and more willingness to try out new ideas than would have been possible, under different circumstances.

Another factor worth considering is the mobility pattern. Over a two-year period, children from Follow-Through and control schools were hardly stable. For example, in the follow-up of Third Grade Follow-Through and control children, less than half of Follow-Through group remained, as compared to 59% of control group who stayed. Were those who were moving out of the district the higher achieving, the more motivated youngsters?

Project Effectiveness and Self-Concept: One of the unusual findings in this report is that Follow-Through children failed to demonstrate consistently significantly higher level of self-concept ratings than did the controls. Only Kindergarten Follow-Through children demonstrated significantly higher self-concept ratings, as compared to comparable control group. When one considers that the Responsive Environment Principle is built around the enhancement of the child's self-concept, it is remarkable that its manifestation was not at all evident. However, this finding may be a function of the test instrument utilized. Teachers' ratings may not truly reflect a valid measurement of the child's self-concept. Furthermore, one wonders also what is self-concept? Are there better, more valid techniques of assessing change in self-concept?

Factors Affecting Achievement and Self-Concept: Speculation on the adverse effects of mobility were not confirmed, as duration of Follow-Through participation was found to have no impact on performance. Attendance, and chronological age were found to have no impact also. The consistent positive effects of teachers' initial self-concept ratings of participants appeared to be somewhat related to the self-fulfilling prophesy, alluded to by Clark in 1965, and by Rosenthal and Jackson in 1968. It should be noted, however, that other variables including PLR scores and selected pre-test measures which were found to be good predictors of performance, were administered at almost the same time as the teachers' self-concept ratings. That time of data collection may in part determine the significance of their influence on performance is strongly suspected. As noted earlier, it appears that the more recent the test data, the higher the probabilities of a significant impact, and vice versa.

Teaching Influence and Performance: Trends were not consistent when mean ratings on the Responsive Classroom Rating Scale were correlated with class performance across four grade levels. Spearman relationship ranged from -1 at kindergarten to 0 at first grade.

When class achievement was correlated with duration of Project experience, correlations were consistently low from first to third grade. The high correlations noted at kindergarten may again be a function of the limited number of kindergarten teachers involved.

Completion of ratings by the Project administrative staff may reflect some biases that would affect the validity of the instrument, and therefore, may not provide a true picture of the real classroom teacher's behavior. The validity of the rating instrument itself, may also be of some question. To summarize briefly, the low correlations between classroom achievement and degree of implementation of responsive principle, as well as between classroom achievement and duration of Project-teaching experience, suggest the existence of other variables which have more impact on class performance.

Recommendations: Based on findings presented earlier, and in interviews with Project staff, the following recommendations are suggested:

1. Project Follow-Through may be contined on a limited basis.
2. Project evaluation should include an assessment of other critical variables affecting children's performance.

III. PROJECT DESCRIPTION

Project Follow-Through served a total of 400 pupils from kindergarten through third grade, during the 1971-1972 school year. A total of 14 classes operated under the Project, with two classes at kindergarten,[1] and four classes each at grades 1, 2, and 3. In addition, two classes at fourth grade, consisting of 66 pupils, received some limited indirect Project services in the form of in-service training from fourth grade classroom teachers.

The Follow-Through School, Mary B. Martin, evidenced the following characteristics during the 1971-1972 school year:

- Approximately nine out of every ten children were on Public Assistance.
- Approximately five out of every ten children attended schools other than the Follow-Through School during the school year.
- Pupils attending the Follow-Through school evidenced an Average level of general mental functioning, based on performance on the Kuhlmann-Anderson Test at three grade levels (grades 2, 3, and 6).
- Pupils at first grade evidenced an Average Readiness status for success in first grade work, based on mean performance of 62.50 (C rating) on the Metropolitan Readiness Tests.
- Pupils attending the Follow-Through school were functioning at least eight months below grade level in basic reading skills, based on performance on the Stanford Paragraph Meaning subtest at entry to grades 2 and 3.

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[1] The original four kindergarten classes were reduced to two classes in February 1972 because of a drop in enrollment.

- Pupils attending the Follow-Through school were functioning at least six months below grade level in basic computational skills, based on the Stanford Arithmetic subtest at entry to grades 2 and 3.

- Pupils attending the Follow-Through school evidenced mean attendance of 163.32, representing 91% of the total 180 school days.

A. Participant Characteristics

A total of approximately 466 pupils were served by the Follow-Through Project. Of this number, 400 pupils representing 86% were enrolled in 14 Follow-Through classes at kindergarten through third grade. The remaining 66 pupils at fourth grade received indirect and limited services through participation of their classroom teachers in locally-conducted Follow-Through in-service sessions.

Average daily membership (ADM) was estimated at 379 pupils from kindergarten through third grade and 62 pupils at fourth grade. ADM pupil distribution by grade and sex follows below:

Grade	Total	Girl	Boy
Kindergarten	77	38	39
1	104	53	51
2	94	53	41
3	104	54	50
4	62	32	30

The Kindergarten Follow-Through pupils evidenced the following characteristics:

- Four out of every ten pupils had preschool experience.

- Pupils were functioning at 26th percentile in readiness skills, based on their performance on the Stanford Early School Achievement Test (SESAT) at entry.

- Mean attendance at the end of the school year was estimated at 159 days, representing 88% of the required 180 school days.

The First Grade Follow-Through pupils evidenced the following characteristics:

- Approximately four out of every ten pupils had preschool experience.
- Approximately five out of every ten pupils attended schools other than the Follow-Through school from kindergarten through first grade, based on the estimated mobility rate[1] of 1.4.
- Mean duration of Follow-Through participation was estimated at 302.78 days, representing 84% of 360 school days (kindergarten through first grade).
- Mean attendance during the 1971-1972 school year was estimated at 165.5 days, representing 92% of the 180 school days.
- Pupils were functioning at the Average level in readiness skills at entry, based on the mean performance of 62.5 (C rating) on the Metropolitan Readiness Tests Total Score.

The Second Grade Follow-Through children evidenced the following characteristics:

- Approximately five out of every ten pupils had preschool experiences.
- Mean duration of Follow-Through participation was estimated at 426.08, representing 79% of the 540 school days (from kindergarten through second grade).
- Mean attendance during the 1971-1972 school year was estimated at 163.7, representing 91% of the 180 school days.

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[1] Mobility index represents a gross measure of how long children stay in a given school or the number of school transfers children make in a year. It represents the ratio of the number of entries, transfers, and withdrawals to the average daily membership for a given school.

- Pupils were functioning at least five months below expectancy in basic reading and math skills at entry to second grade.

The Third Grade Follow-Through pupils demonstrated the following characteristics:

- Approximately five out of every ten pupils had preschool experiences.
- Approximately five out of every ten pupils attended schools other than the Follow-Through school from kindergarten through third grade, based on the estimated mobility rate of 1.94.
- Mean duration of Follow-Through participation was estimated at 465 days, representing 66% of the 720 school days (from kindergarten through third grade).
- Mean attendance during the 1971-1972 school year was estimated at 165.7 days, representing 92% of the 180 school days.
- Participants were functioning on the average 1.3 years below expectancy in basic reading skills at entry to third grade.
- Participants were functioning on the average one year below expectancy in basic math skills at entry to third grade.

Pupils at fourth grade evidenced the following characteristics:

- Approximately four out of every ten pupils had preschool experience.
- Approximately five out of every ten pupils attended schools other than the Follow-Through school, based on the estimated mobility rate of 2.10.
- Mean duration of attendance in this school was estimated at 541.87 days, representing 67% of the 810 school days (from kindergarten through fourth grade).
- Mean attendance during the 1971-1972 school year was estimated at 163.5, representing 91% of the 180 school days.

- Participants were functioning on the average two years below expectancy in reading skills at entry to fourth grade.

B. Project Operations

Project Follow-Through operated a total of 14 classes, kindergarten through third grade, and offered limited consultation services to two classes at the fourth grade. Unique components of the 14 Follow-Through classes were as follows:

- A full day program for Kindergarten Follow-Through pupils in contrast to the half-day programs for non-Kindergarten Follow-Through classes.
- Application of the Responsive Environment Principle at kindergarten through third grade.
- Use of the Language Experiences in Reading (LEIR).
- Use of the Curriculum Development Associates (CDA) math program.
- Regular in-service sessions.
- Creative utilization of paraprofessional and volunteer personnel in the classroom.
- Comprehensive supportive services including medical-dental-social-psychological services.
- Real and active parent involvement.
- Employment of low-income neighborhood residents.

At fourth grade, participation of fourth grade classroom teachers in Follow-Through in-service sessions represented its only association with the Project. The general object of this limited service was to help these classroom teachers, whose classes are following the traditional classroom teaching, which is to acquire some understanding of the Responsive Environment Principle, as a majority of their pupils had been in Project Follow-Through.

Instruction and Curriculum: The curriculum utilized at Project Follow-Through, kindergarten through third grade, is based upon the Responsive Environment Follow-Through Program. This program is based on the following basic principles:

- Children learn at different rates.
- Children learn in different ways.
- Children learn best when they are interested in what they are learning.

The Responsive Environment Program consists of the following processes:

- The learning environment should be responsive to the child.
- The child should be free to explore the learning environment.
- The child should be free to set his own pace of learning.
- The learning activities should not depend upon extrinsic rewards that are not a part of the learning experience.
- Whenever possible, the child should be informed about the consequences of his acts.
- The environment should be arranged so the child is likely to make a series of interconnected discoveries about his physical environment and social world.

The principles of the Responsive Environment approach served as the basic guidelines in developing curriculum for five subject areas. These subject areas included Reading, Science, Social Studies, Mathematics, and Physical Education:

- Reading - The "Van Allen Language Experience in Reading" (LEIR) has been utilized in the first, second, and third grade. This approach makes no definitive distinction between the reading program and the development of listening, speaking, and writing skills. The LEIR approach plans for developing a basic sight vocabulary and competence in using a variety of word recognition skills, for providing a wide variety of reading materials and integrating the various communication skills, and of developing motivation to read.

A design for reading is stimulated through the child's realization that his oral language expression, based upon his own experiences and thoughts, can be written and read along with reading the thoughts and ideas of others. The Language Experience Approach does not require regular reading periods and follow-up activities for each day for every child.

(Refer to Appendix A-2 for a sample of a unit lesson).

- Science - Science instruction was based upon the Material Objects and Relativity subjects from the Science Curriculum Improvement Study Program (SCIS). The two units represent the units utilized by the Project. The program "Material Objects" unit uses the properties of matter as the vehicle to develop the process skills such as observation, classification interpretation, size-time-space relationships, communication, and sensory perception. Children are provided with experiences that help to learn these skills in a developmental structure, building on earlier acquired skills. One of the main objectives of the program is to involve children in independent activity with as little "teacher interference" as possible. The teacher acts as a resource person and moves from child to child, or mini-group to mini-group, personalizing the instruction and trying to accommodate for individual differences in the group.

  (Refer to Appendix A-3 for a sample of a unit lesson).

- Social Studies - Emphasis is placed on learning activities that deepen the child's understanding of his environment. The Materials and Activities for Teachers and Children (MATCH) Project was utilized as one of the vehicles to help the child understand his environment. Pupils are allowed to experience with varieties of phenomena including acting on the MATCH materials. Learning occurs then through child's direct experiences, rather than through the traditional one-sided teacher's input. These materials also help the teacher to structure activities which will help children learn from what they are doing rather than from what they are being told.

  (Refer to Appendix A-4 for a sample of a unit lesson).

- Mathematics - The Curriculum Development Associates (CDA) approach provides for individual discoveries through use of manipulative aids and devices essential in building mathematical concepts. Each child will be an active participant in concept development at the concrete and semi-concrete stages. Primary emphasis focuses on thinking, reasoning, and understanding rather than on purely mechanical responses. Extensive use has been made of both the logical structure of mathematics and the discovery approach to learning.

  (Refer to Appendix A-5 for a sample of a unit lesson).

- Physical Education - The physical education curriculum has concentrated on movement education. Opportunities were created for children to learn about and experience movement in all forms to understand how movement influences the way he feels about himself, and the degree to which movement influences his achievements.

  Teaching techniques utilize problem solving techniques ranging from extremely free movement experiences to those designed with more structure.

C. Staff Development

Staff development represented one of the critical components of Project Follow-Through. Its purpose is to provide an in-depth understanding of the philosophy and theory underlying the Responsive Environment Principle. Continuing efforts on its integration with classroom techniques and procedures through classroom observations, regular communication among all parties (staff-administrators-Sponsor), involving regular feedback of all processes, etc., have been attempted.

Staff development has been conducted at two levels:

- At the local level, the two program advisors of the administrative staff were responsible for conducting in-service sessions for the 25 professional and 25 paraprofessional staff.
- At the national level, the Program Sponsor, Far West Laboratories, conducts regional meetings in different sections of the country and has been attended by the local Follow-Through administrative staff.

The in-service sessions conducted at the local level included the following activities:

- A four-day orientation workshop prior to the opening of the 1971-1972 school year.
- In-service session for all Follow-Through staff was held twice a month,with each session lasting for 1 1/2 hours.
- In-service session by grade level was held once a week, with each session lasting an hour.

The following topics were discussed in these meetings:

- Role and Contribution of Evaluation to the Follow-Through Project.
- Effective Utilization of Parent Involvement and Volunteers in Project Follow-Through.
- Assessment of Pupil Progress.
- Feedback of 1970-1971 Evaluation.
- Limits of the Responsive Environment.
- Demeaning Teacher Behavior.
- Care and Use of Equipment Involved in the Responsive Environment.
- Overview of Follow-Through.
- Curriculum Development Associates Math.
- Language Experiences in Reading.
- Individualizing Instruction.
- Discipline.
- Developing Basic Skills in A Responsive Environment.

At the national level, a total of three regional meetings were attended by the Project administrative staff. In addition, a total of nine workshops was conducted by the Program Sponsor, in Cleveland for all Follow-Through staff.

Content of the regional meetings included the following:

- Problems in the implementation of the Responsive Environment Principle.
- Assessment of classroom techniques through classroom observations.
- Communication and feedback.
- Curriculum in the Responsive Environment.

The other nine workshops were jointly sponsored by the Far West Laboratory and the local Follow-Through administrative staff. These meetings were addressed directly to the actual classroom processes such as the following:

- Implementation of the LEIR approach.
- Implementation of the CDA Math program.
- Individualized instruction.
- Establishment of limits and discipline in the Responsive Environment classroom.
- Effective utilization of Toy Library Centers.

D. Supportive Services

Provision of comprehensive supportive services represents a significant change in the role of the Follow-Through School. It is not only a place of learning, but has assumed a new role as a coordinating agency in the community. It has attempted to integrate comprehensive social welfare services and real parent commitment into the total learning situation.

Supportive services consisted of medical, dental, psychological, social-work, and parent involvement. A description of the activities provided by these services follows:

Psychological Services:

- Sixty-three children received psychological assessment.
  - Thirty-eight referred for intellectual evaluation.
  - Twenty-five referred for social-emotional difficulties.
- Fifty conferences with teachers relative to psycholocial assessment of children.
- Twenty-two conferences with parents.
- Nineteen pupils were seen for crisis-intervention.
- Thirty-three pupils were referred to more appropriate resources for additional help.
- Twenty-six pupils participated in psychologist-conducted group meetings.
- Seventy-seven pupils participated in a psychologist-organized tutoring program across age and grade groups.

Social Work Services: A total of approximately 250 children received social work services. Services ranged from the simple provision of appropriate school clothing or shoes to the complex task of helping parents work with behavior problems of the child.

Some excerpts from the report of the social worker follows below:

- "....unfortunately, many of the children attending Mary B. Martin School are often denied simple material things which are needed for acceptance among their peers. The need for proper clothing and shoes is obvious. Whenever the principal has shoe certificates, the social worker immediately contacts the child's parents in order to determine if it would be all right for their children to accept them. Following presentation, the social worker takes the child or children to purchase shoes or boots for them. Some, used, but wearable clothing is kept on hand to be given out by the social worker in cases of emergencies.

- "Social worker works closely with many of the component parts of Follow-Through. Home visits are made to emphasize the importance of the parents keeping dental appointments for their children. If the parents are unable to take the child to the dentist or doctor, the social worker assumes these responsibilities. When the children become ill at school, the parents are notified by the social worker. If hospitalization is required as noted in several cases, the social worker assumes this responsibility following parent's approval.

- "Absenteeism is an acute problem with many children in school. In order to find out the reason for the child's continued absenteeism, the social worker makes periodic home visits in order to talk with the child's parents.

- "Behavioral problems are often noted in the classroom. When the teacher finds it difficult to cope with the situation, team meetings including the social worker are held. Infrequently, the psychologist may think it necessary to make a referral to a definite clinic. The social worker, parents and child work very closely together in such cases."

Medical: A total of 200 children received direct medical services provided by a private and by a school physician. One hundred and eighteen of these children representing 59% were seen by a private physician, and the remaining 82 (41%) were seen by the school physician.

The following services were provided by the private physician.

- Complete physical examination.
- Urinalysis.
- Hematocrat.
- Testing for sickle cell anemia.
- Immunization.
- Treatment of tonsillitis, ear infections, conjnctivitis, and dermatitis.

The following services were provided by the school health services:

- Complete physical examination.
- Tuberculin testing.
- Immunization and vaccinations.

Dental Services: All Follow-Through children received general dental screening examinations at the beginning of the 1971-1972 school year. In addition, toothbrush kits and dental floss along with short lessons in nutrition and dental care were provided.

Additional dental services included the following:

- Two hundred twenty-nine children found to have dental defects were referred to private dentists.
- Private dental services for these children included full mouth rehabilitation-prophylaxis, fluoride treatments, and restorative dentistry.

Parent Involvement: Parent participation in this Project occurred at two levels:

- At the grassroots level among parents of Follow-Through participants.
- At the upper echelon level among the elected membership of the Parents' Advisory Committee (PAC).

Parents of Follow-Through children attended ten parent group meetings during the 1971-1972 school year, which reported an average attendance of 37 parents. Topics in these meetings ranged from a discussion of the Follow-Through organizational chart to a discussion on the outstanding contribution of the Negroes to the American society.

In addition, a total of seven special parent activities were conducted under Follow-Through direction. These activities included the following:

- Tour of Cleveland's Karamu House and the Booth Talbert Clinic (23 present).

- A two-day educational tour of Washington, D.C. (41 present).

- Lecture for the Cleveland Police Department on Drugs (37 present).

- Meetings with the district councilmen to discuss the need for school guards and what to do about empty buildings in the vicinity of the Follow-Through School.

- Luncheon meetings.

The PAC represents the planning and decision-making body. Approximately more than 50% of its membership was elected among Follow-Through parents. The remaining were non-Follow-Through parents who were appointed to their position by Follow-Through parents and the local health-welfare agencies.

A total of eight PAC meetings was held during the school year, which reported an average attendance of 14 parents.

IV. EVALUATION

Selection of control schools at kindergarten to fourth grade continued to be based on their 'approximate' comparability to the Follow-Through school on three measures: poverty,[1] mobility,[2] and achievement indices.[3] The same schools utilized in previous school years for evaluation of Project Follow-Through (kindergarten through third grade) continued to serve as controls during the 1971-1972 school year.

Data for these three indices (Chart I) by school indicated the following key findings:

> Kindergarten: Follow-Through school tended to be slightly poorer and lower in achievement than the control school. However, both groups were almost comparable in mobility patterns.
>
> First Grade: Follow-Through school was considerably higher in poverty and in mobility indices, but lower in achievement than Control 1 school.
>
> Both Follow-Through and Control 2 schools were comparable in poverty. However, Control 2 school showed considerable lower mobility and higher achievement when compared to Follow-Through school.

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[1] Poverty index represents a gross measure of socio-economic patterns of children attending a particular school. It represents the ratio of the number of children from Public Assistance families for a given school to the total number of children from Public Assistance families.

[2] Mobility index represents a gross measure of the number of school transfers children make in a year. It represents the ratio of the number of entries, transfers, and withdrawals to the average daily membership for a given school.

[3] Achievement index represents a gross measure of learning occurring in a given school based on median scores obtained on the Kuhlmann-Anderson (B, CD, and EF), on the Comprehensive Test of Basic Skills (CTBS) Reading Comprehension and Arithmetic Computation subtests.

Second Grade: Follow-Through school was considerably higher in poverty and in mobility indices, as compared to Control School. However, control school evidenced slightly higher achievement than did Follow-Through school.

Third Grade: Both Follow-Through and control schools were generally comparable in poverty indices. However, Follow-Through school evidenced higher mobility index and lower achievement as compared to Follow-Through school.

Fourth Grade: Both Follow-Through and Control 1 schools were comparable in poverty index. However, Control 1 school was considerably higher in mobility, and slightly higher in achievement, when compared to Follow-Through school.

Follow-Through school tended to be comparable in poverty and in mobility indices as compared to Control 2 school. However, Control 2 school tended to be slightly higher in achievement when compared to Follow-Through school.

These three measures represent at least rough indicators of the general comparability of Follow-Through and Control schools. The comparability of these control schools with the Follow-Through school represents only an approximate estimation, in the absence of better methods of gauging comparability. The reader is, therefore, urged to exercise some caution in the interpretation of the findings.

CHART I

COMPARABILITY OF FOLLOW-THROUGH AND CONTROL SCHOOLS BY VARIABLE

School	Poverty	Mobility	PLR[1]			CTBS Reading Comprehension[2]		CTBS Arithmetic Computation[3]		
			Grades			Grades		Grades		
			2	3	6	3	6	3	5	6
Follow-Through School	94	86	97	90	94	2.7	4.3	2.5	3.9	5.6
Control at Kindergarten	82	93	98	90	89	2.9	4.6	3.0	4.3	5.6
Control 1 at First Grade	54	67	100	94	91	3.1	4.6	2.8	4.6	6.1
Control 2 at First Grade	95	50	98	98	94	3.2	4.7	3.5	4.7	6.6
Control at Second Grade	76	69	98	89	93	2.9	4.6	3.2	4.3	5.9
Control at Third Grade	97	67	110	94	97	2.9	4.1	3.0	4.7	5.6
Control 1 at Fourth Grade	97	108	92	90	84	2.8	4.1	3.1	4.3	6.6
Control 2 at Fourth Grade	89	85	112	91	87	3.1	4.1	3.0	4.3	5.7

[1] Based on PLR scores (Kuhlmann-Anderson) at the three grades administered as a part of the city-wide testing.

[2] Median grade equivalent units based on Comprehensive Test of Basic Skills Reading subtest at the two grades administered as a part of the city-wide testing.

[3] Median grade equivalent units based on Comprehensive Test of Basic Skills Arithmetic Computation subtest at the three grades administered as a part of the city-wide testing.

A. Evaluation of 1971-1972 Kindergarten Follow-Through Project

The evaluation report on the 1971-1972 Kindergarten Follow-Through Project will attempt to respond to the following questions:

- Did Kindergarten Follow-Through children show significantly higher level of performance than control groups in readiness skills and attendance?
- Were there factors other than present kindergarten placement which is exerting some influence on children's performance?

1. Design

A four-factorial multivariate analysis of covariance design (Sex x Preschool Experience x Teacher x School) served as the basic design:

Sex
- Girl
- Boy

Preschool Experience
- No Preschool Experience
- With Preschool Experience

School
- Control
- Follow-Through

Teacher
- A Control
- B

- C Follow-Through
- D

Dependent Variables (May 1972)

Metropolitan Readiness Word Meaning
Metropolitan Readiness Listening
Metropolitan Readiness Matching
Metropolitan Readiness Alphabet
Metropolitan Readiness Numbers
Metropolitan Readiness Copying

Stanford Early School Achievement (SESAT) Environment
SESAT Mathematics
SESAT Letters and Sounds
SESAT Aural Comprehension
Attendance
Self-Concept Rating

Independent Variables (Covariates) (October 1971)

SESAT Environment
SESAT Mathematics
SESAT Letters and Sounds
SESAT Aural Comprehension
Self-Concept Rating
Chronological Age
Mobility

2. Presentation of Findings[1,2]

The following findings were summarized from the analysis:

- Differences attributed to school were highly significant ($p < .0001$).
- Differences attributed to preschool experience were highly significant ($p < .001$).
- Differences attributed to teachers were highly significant ($p < .001$).

a. Controls Vs. Follow-Through Children at Kindergarten

This discussion will attempt to provide answers to the following question: Did Kindergarten Follow-Through children show significantly higher level of achievement, attendance, and self-concept ratings?

Kindergarten Follow-Through children demonstrated significantly higher readiness skills ($p < .001$ to $p < .0001$) than did the control group (Table 1).

---

[1] Multivariate and Stepdown F-values were based on mean scores adjusted for unequal number of cases and effects of five pre-test measures (Stanford I subtests and self-concept rating).

[2] Mean scores presented in the subsequent tables represent adjusted scores. Refer to Tables B-1 to B-3 in Appendix B for real or observed scores.

TABLE 1

ADJUSTED MEAN SCORES AND STEPDOWN F-VALUES: CONTROL VS. FOLLOW-THROUGH CHILDREN AT KINDERGARTEN*

Dependent Variable	Control	Follow-Through	Stepdown F
MRT Word Meaning	7.71	8.43	1.13
MRT Listening	9.18	11.60	21.82**
MRT Matching	9.12	9.64	0.05
MRT Alphabet	13.01	12.89	0.81
MRT Numbers	11.56	12.42	0.01
MRT Copying	5.53	6.02	2.94
SESAT Environment	28.37	27.91	1.14
SESAT Mathematics	16.14	17.16	3.38
SESAT Letters and Sounds	18.67	17.36	2.20
SESAT Aural Comprehension	15.96	17.18	1.60
Attendance	167.40	158.90	15.79**
Self-Concept Rating	3.05	3.70	10.69***

* Multivariate F = 6.40, $p < .0001$

** $p < .0001$

*** $p < .001$

- Overall group difference was highly significant.
- Three out of 12 dependent variables contributed significantly to the overall group difference: Follow-Through children evidenced higher levels of word analysis skills (MRT Listening) and self-concept ratings than did the other group. However, control children showed significantly higher attendance than did the Follow-Through children.

b. Differences Between Teachers Within Control and Follow-Through Schools

This discussion will attempt to respond to the following question: Were there differences in performance between different classrooms?

Analysis of classroom performance on the 12 dependent variables as one measure of teacher effect indicated that teacher differences were highly significant ($p < .001$) within control and Follow-Through schools (Table 2).

TABLE 2

SUMMARY OF MULTIVARIATE F-VALUES FOR TEACHER COMPARISONS BASED ON TWELVE DEPENDENT VARIABLES

Teacher Comparisons	Teacher Holding Advantage	Multivariate F-Values	p
Control School			
A Vs. B	B	3.09	$p < .001$
Follow-Through School			
C Vs. D	C	3.26	$p < .001$

The following two tables summarize the findings based on comparisons between kindergarten teachers from control and Follow-Through schools.

TABLE 3

ADJUSTED MEAN SCORES AND STEPDOWN F-VALUES: TEACHER A VS. B IN CONTROL SCHOOL AT KINDERGARTEN*

Dependent Variable	Teacher A	Teacher B	Stepdown F
MRT Word Meaning	5.22	10.20	16.88*
MRT Listening	7.82	10.58	0.14
MRT Matching	10.69	7.56	8.79**
MRT Alphabet	12.61	13.41	1.84
MRT Numbers	11.05	12.06	0.23
MRT Copying	5.91	5.15	1.48
SESAT Environment	25.62	31.12	1.89
SESAT Mathematics	15.69	16.59	1.02
SESAT Letters and Sounds	18.57	18.76	0.05
SESAT Aural Comprehension	15.55	16.38	1.11
Attendance	168.10	166.60	0.09
Self-Concept Rating	3.01	3.10	2.02

* $p < .0001$
** $p < .05$

- Overall group difference was highly significant ($p < .0001$) in favor of Teacher B.

- Two out of 12 dependent variables contributed significantly to the overall group difference: Control class under Teacher B demonstrated better-developed verbal concepts (MRT Word Meaning) than did the other control class. However, the control class under Teacher A showed significantly better visual-perceptual skills (MRT Matching) than did the group under Teacher B.

TABLE 4

ADJUSTED MEAN SCORES AND STEPDOWN F-VALUES: TEACHER C VS. D IN FOLLOW-THROUGH SCHOOL AT KINDERGARTEN*

Dependent Variable	Teacher C	Teacher D	Stepdown F
MRT Word Meaning	10.45	6.41	24.99**
MRT Listening	12.46	10.73	0.05
MRT Matching	10.67	8.60	0.56
MRT Alphabet	14.26	11.52	2.20
MRT Numbers	12.90	11.95	1.04
MRT Copying	6.11	5.94	1.39
SESAT Environment	28.52	27.30	0.04
SESAT Mathematics	17.31	17.01	0.02
SESAT Letters and Sounds	17.85	16.88	0.37
SESAT Aural Comprehension	17.46	18.14	1.38
Attendance	161.60	156.10	4.51***
Self-Concept Rating	4.02	3.37	1.66

* $p < .001$
** $p < .0001$
*** $p < .05$

- Overall group difference was highly significant ($p < .001$) in favor of Teacher C.

- Two out of 12 dependent variables contributed significantly to the overall group difference: Follow-Through class under Teacher C demonstrated higher levels of verbal concepts (MRT Word Meaning) and attendance than did the class under Teacher D.

c. No Preschool Vs. Preschool Experience

This discussion will attempt to respond to the following question: Were there differences in readiness skills, self-concept, and attendance between children with and without preschool experiences at Kindergarten Follow-Through and control classes?

Table 5 indicated that differences between the two groups were highly significant (p<.001), with the most evident differences noted in MRT Word Meaning subtest and Attendance.

TABLE 5

ADJUSTED MEAN SCORES AND STEPDOWN F-VALUES: NO PRESCHOOL VS. PRESCHOOL EXPERIENCE AT KINDERGARTEN*

Dependent Variable	No Preschool	Preschool	Stepdown F
MRT Word Meaning	8.43	7.70	9.01**
MRT Listening	10.73	10.04	0.15
MRT Matching	8.76	10.00	0.25
MRT Alphabet	12.78	13.12	0.86
MRT Numbers	12.39	11.59	2.21
MRT Copying	6.20	5.35	2.74
SESAT Environment	28.40	27.88	0.83
SESAT Mathematics	16.73	16.57	0.05
SESAT Letters and Sounds	17.73	18.30	0.16
SESAT Aural Comprehension	17.18	16.58	0.40
Attendance	159.80	166.50	13.99**
Self-Concept Rating	3.53	3.22	1.13

* Multivariate F = 2.84, p<.001
** p<.001

- Two out of 12 dependent variables contributed to the group difference: Children with no preschool demonstrated higher verbal concepts (MRT Word Meaning) than did those with preschool experience. However, children with preschool showed higher attendance than did those with no preschool experience.

d. Effects of Independent Variables on Achievement, Self-Concept, and Attendance

This discussion will attempt to respond to the following question: To what degree did the pre-test measures correlate with achievement, self-concept, and attendance measures? Which of the seven pre-test measures appeared to be the best predictor of the dependent variables?

An overall significant degree of association between the two sets of dependent and independent variables was noted: Multivariate F = 1.72, $p < .0001$. Two out of the seven covariates demonstrated a significant degree of correlation with the twelve dependent variables, when the contribution of each covariate was analyzed independently.

A regression analysis of the 12 dependent and seven independent variables indicated the following key findings:

- Approximately 10.24% of the variance of the dependent variables may be attributed to the effects of the seven covariates.
- The seven covariates appeared to have significant influence on all dependent variables.

Analysis of the independent contribution of the seven covariates indicated that only two turned out to be significant predictors of achievement, self-concept and attendance at the end of the school year. The following observation was noted:

- The SESAT Environment and Mathematics subtests demonstrated significant influences ($p < .0006$ and $p < .01$) on children's performance at the end of kindergarten. The higher the Environment and Mathematics initial scores, the higher were the performance levels at the end of the school year.

B. Evaluation of 1971-1972 First Grade Follow-Through Project

The evaluation report of the 1971-1972 First Grade Follow-Through Project will attempt to respond to the following questions:

- Did First Grade Follow-Through children show significantly higher level of basic achievement skills and attendance than did the comparable control group?
- Were there factors other than Child Development experience and present first grade placement which are exercising some influences on children's performance?

1. Design

A five-factorial multivariate analysis of covariance cross-nested design (Sex x Economic Status x Preschool Experience x School x Teacher Nested in School) served as the basic design:

Sex
- Girl
- Boy

Economic Status[1]
- Poor
- Non-Poor

Preschool Experience
- No Preschool Experience
- With Preschool Experience

School
- Control
- Follow-Through

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[1] Identification of Non-Poor and Poor children was based on eligibility criteria for the free federal lunch program. Data was available from the child's permanent record card.

Teacher

. A . B	Control 1
. C . D	Control 2
. E . F . G . H	Follow-Through

Dependent Variables (May 1972)

Stanford Primary I (Form X) Paragraph Meaning
Stanford Primary I (Form X) Vocabulary
Stanford Primary I (Form X) Word Reading
Stanford Primary I (Form X) Arithmetic
Self-Concept Rating
Attendance

Independent Variables

Metropolitan Readiness Tests Total Score (May 1971)
Self-Concept Rating (October 1971)
Chronological Age
Mobility

2. Presentation of Findings[1,2]

The following key findings were summarized from the analysis:

- Differences attributed to School Factor were significant ($p < .0001$).
- Differences attributed to Teacher Factor were significant ($p < .05$ to $p < .0001$).
- Differences attributed to sex, preschool experience, and socio-economic status were not significant.

---

[1] Multivariate and Stepdown F-values were based on mean scores adjusted for unequal number of cases (N) and effects of four measures (Metropolitan Readiness Tests Total Score, Mobility, Chronological Age, and Self-Concept Rating) serving as covariates.

[2] Refer to Tables B-4 and B-5 for the real or observed mean scores in Appendix B.

Controls Vs. Follow-Through at First Grade

This discussion will attempt to provide answers to the following questions: Did First Grade Follow-Through children show significantly higher level of achievement skills and attendance than did control children?

Tables 6-7 indicated that differences were highly significant when Follow-Through children were compared with either Control School 1 or 2 children. Group differences were consistently in favor of Follow-Through children.

TABLE 6

ADJUSTED MEAN SCORES AND STEPDOWN F-VALUES: CONTROL 1 VS. FOLLOW-THROUGH AT FIRST GRADE*

Dependent Variable	Control 1	Follow-Through	Stepdown F
Stanford I Paragraph Meaning	13.74	18.21	7.25**
Stanford I Vocabulary	18.50	15.40	37.60**
Stanford I Word Reading	18.82	20.12	0.82
Stanford I Arithmetic	26.67	34.06	6.78***
Self-Concept Rating	3.19	3.29	0.10
Attendance	165.80	165.50	1.82

* Multivariate F = 9.52, $p < .0001$
** $p < .001$
*** $p < .01$

- Overall group difference was highly significant ($p < .0001$) in favor of Follow-Through children.

- Three out of six variables contributed significantly to the overall group difference: Follow-Through children evidenced better comprehension (Paragraph Meaning) and basic math skills (Arithmetic) than did the controls. However, the control children showed higher level of vocabulary skills (Vocabulary) than did the Follow-Through group.

TABLE 7

ADJUSTED MEAN SCORES AND STEPDOWN F-VALUES: CONTROL 2 VS. FOLLOW-THROUGH AT FIRST GRADE*

Dependent Variable	Control 2	Follow-Through	Stepdown F
Stanford I Paragraph Meaning	15.37	18.21	0.99
Stanford I Vocabulary	14.32	15.40	0.01
Stanford I Word Reading	17.65	20.12	9.36**
Stanford I Arithmetic	24.03	34.66	17.98*
Self-Concept Rating	3.35	3.29	4.97***
Attendance	161.40	165.50	1.41

* $p < .0001$
** $p < .001$
*** $p < .05$

- Overall group difference was highly significant ($p < .0001$) in favor of Follow-Through children.

- Three out of six variables contributed significantly to the overall group difference: Follow-Through children evidenced significantly better skills in analyzing a word without the aid of a context (Word Reading) and in basic math skills (Arithmetic) than did control children. However, control children evidenced significantly higher self-concept ratings than did Follow-Through children.

Differences Between Teachers Within Control and Follow-Through Schools

This discussion will attempt to respond to the following question: Were there differences in performance between classrooms within control and Follow-Through schools?

Table 8 indicates that classroom differences were highly significant ($p < .01$). This finding appears to indicate that teacher differences were present and appear to transcend even differences between Follow-Through and control groups.

TABLE 8

SUMMARY OF MULTIVARIATE F-VALUES FOR TEACHER COMPARISONS AT CONTROL AND FOLLOW-THROUGH FIRST GRADE CLASSES

Teacher Comparisons	Teacher Holding Advantage	Multivariate F-Value	p
Control 1			
A Versus D	D	2.95	$p < .01$
B Versus D	D	5.34	$p < .0001$
C Versus D	C	7.82	$p < .0001$
Control 2			
E Versus F	F	4.44	$p < .0001$
Follow-Through			
G Versus J	G	4.84	$p < .0001$
H Versus J	H	12.27	$p < .0001$
I Versus J	J	8.02	$p < .0001$

When teachers were ranked according to overall classroom achievement from highest to lowest, the following were noted:

Control 1
- Teacher C
- Teacher D
- Teacher B
- Teacher A

Control 2
- Teacher F
- Teacher E

Follow-Through
- Teacher H
- Teacher G
- Teacher I
- Teacher J

The following seven tables summarize the comparisons of individual pairs of teachers which resulted in significant differences, within the two control and the Follow-Through schools.

TABLE 9

ADJUSTED MEAN SCORES AND STEPDOWN F-VALUES FOR TEACHER COMPARISONS AT CONTROL 1 SCHOOL AT FIRST GRADE: TEACHER A VS. D (A), TEACHER B VS. D (B), TEACHER C VS. D (C)

A. TEACHER A VS. D*

Dependent Variable	Teacher A	Teacher D	Stepdown F
Stanford I Paragraph Meaning	10.32	13.86	5.19*
Stanford I Vocabulary	14.18	19.84	8.04**
Stanford I Word Reading	15.70	15.85	0.01
Stanford I Arithmetic	24.49	33.02	0.09
Self-Concept Rating	2.77	3.02	2.67
Attendance	161.10	167.40	1.50

* p<.01
** p<.001

- Overall group difference between Teachers A and D was highly significant (p<.01) in favor of Teacher D.

- Two out of six dependent variables contributed significantly to the overall group difference: Children under Teacher D evidenced significantly higher level of basic reading skills (Paragraph Meaning and Vocabulary) than did the group under Teacher A.

B. TEACHER B VS. D*

Dependent Variable	Teacher B	Teacher D	Stepdown F
Stanford I Paragraph Meaning	11.34	10.77	12.07*
Stanford I Vocabulary	17.67	19.84	2.37
Stanford I Word Reading	18.66	15.85	2.73
Stanford I Arithmetic	20.72	33.02	12.50*
Self-Concept Rating	3.06	3.02	0.44
Attendance	168.00	167.40	0.81

* $p < .0001$

- Overall group difference was highly significant ($p < .0001$).
- Two out of six dependent variables contributed significantly to the overall group difference: Children under Teacher B evidenced higher comprehension skills (Paragraph Meaning) than did the group under Teacher D. However, children under Teacher D showed higher computational skills (Arithmetic) than did the group under Teacher B.

C. TEACHER C VS. D*

Dependent Variable	Teacher C	Teacher D	Stepdown F
Stanford I Paragraph Meaning	22.54	10.77	30.42*
Stanford I Vocabulary	22.31	19.84	1.62
Stanford I Word Reading	25.05	15.85	3.35**
Stanford I Arithmetic	28.44	33.02	5.55***
Self-Concept Rating	3.87	3.02	2.55
Attendance	166.80	167.40	1.51

* $p < .0001$
** $p < .05$
*** $p < .01$

- Overall group difference was highly significant ($p < .0001$).

- Three out of six variables contributed significantly to the overall group difference: Children under Teacher C demonstrated higher level of basic reading skills including comprehension (Paragraph Meaning), and word analysis skills (Word Reading). However, children under Teacher D demonstrated higher level of basic computational skills (Arithmetic) as compared to children under Teacher C.

TABLE 10

ADJUSTED MEAN SCORES AND STEPDOWN F-VALUES FOR TEACHER COMPARISONS AT CONTROL 2 SCHOOL AT FIRST GRADE: TEACHER E VS. F*

Dependent Variable	Teacher E	Teacher F	Stepdown F
Stanford I Paragraph Meaning	12.50	16.32	6.58***
Stanford I Vocabulary	14.69	14.20	0.37
Stanford I Word Reading	16.10	18.17	0.02
Stanford I Arithmetic	19.39	25.58	9.54**
Self-Concept Rating	2.80	3.56	7.77***
Attendance	164.90	160.20	1.44

* $p < .0001$
** $p < .001$
*** $p < .01$

- Overall group difference was highly significant ($p < .0001$)

- Three out of six variables contributed significantly to the overall group difference: Children under Teacher F showed a higher level of comprehension (Paragraph Meaning) and basic math skills (Arithmetic) as well as higher self-concept ratings than the group under Teacher E.

TABLE 11

ADJUSTED MEAN SCORES AND STEPDOWN F-VALUES FOR TEACHER COMPARISONS AT FOLLOW-THROUGH SCHOOL AT FIRST GRADE: TEACHER G VS. J (D), TEACHER H VS. J (E), TEACHER I VS. J (F)*

D. TEACHER G VS. J*

Dependent Variable	Teacher G	Teacher J	Stepdown F
Stanford I Paragraph Meaning	20.07	11.68	8.42**
Stanford I Vocabulary	14.93	16.32	0.34
Stanford I Word Reading	21.93	18.17	0.24
Stanford I Arithmetic	36.76	26.49	2.56
Self-Concept Rating	2.96	3.30	13.87*
Attendance	162.20	163.80	2.55

* $p < .0001$
** $p < .001$

- Overall group difference was highly significant ($p < .0001$).

- Two out of six variables contributed significantly to the overall group difference: Children under Teacher G demonstrated a higher level of comprehension skills (Paragraph Meaning). However, children under Teacher J evidenced higher self-concept ratings than did those under Teacher G.

E. TEACHER H VS. J*

Dependent Variable	Teacher H	Teacher J	Stepdown F
Stanford I Paragraph Meaning	23.39	11.68	49.29*
Stanford I Vocabulary	15.07	16.32	2.90
Stanford I Word Reading	23.20	18.17	0.02
Stanford I Arithmetic	29.50	26.49	5.94***
Self-Concept Rating	3.12	3.30	9.12**
Attendance	163.70	163.80	1.68

* $p < .0001$
** $p < .001$
*** $p < .01$

- Overall group difference was highly significant ($p < .0001$).

- Three out of six variables contributed significantly to the overall group difference: Children under Teacher H evidenced a higher level of comprehension (Paragraph Meaning) and computational skills (Arithmetic) than did the group under Teacher J. However, children under Teacher J evidenced higher self-concept ratings.

F. TEACHER I VS. J*

Dependent Variable	Teacher I	Teacher J	Stepdown F
Stanford I Paragraph Meaning	17.71	11.68	0.22
Stanford I Vocabulary	15.28	16.32	3.43
Stanford I Word Reading	17.19	18.17	12.84**
Stanford I Arithmetic	45.90	26.49	23.42*
Self-Concept Rating	3.75	3.30	4.04***
Attendance	172.60	163.80	1.11

* $p < .0001$
** $p < .001$
*** $p < .05$

- Overall group difference was highly significant ($p < .0001$).
- Three out of six variables contributed significantly to the overall group difference: Children under Teacher J evidenced a higher level of word analysis skills (Word Reading) than did the other group. However, children under Teacher I evidenced significantly higher level of basic math skills (Arithmetic) and self-concept ratings than did the group under Teacher J.

C. Evaluation of 1971-1972 Second Grade Follow-Through Project

The evaluation report of the 1971-1972 Second Grade Follow-Through Project will attempt to respond to the following questions:

- Did Second Grade Follow-Through children show significantly higher level of basic achievement skills and attendance than did the comparable control group?
- Were there factors other than Child Development experience and present second grade placement which are exercising some influences on children's performance?
- What was the nature of the test instrument (Stanford Primary II) which was used to evaluate basic skills of children in the Project?

1. Design

A five-factorial multivariate analysis of covariance cross-nested design (Sex x Economic Status x Preschool Experience x School x Teacher Nested in School) served as the basic design:

Sex
- Girl
- Boy

Economic Status[1]
- Non-Poor
- Poor

Preschool Experience
- No Preschool Experience
- With Preschool Experience

School
- Control
- Follow-Through

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[1] Identification of Non-Poor and Poor children was based on eligibility criteria for the free federal lunch program.

Teacher

. A . B . C	Control
. D . E . F . G	Follow-Through

Dependent Variables (May 1972)

Stanford Primary II (Form X) Paragraph Meaning
Stanford Primary II (Form X) Word Meaning
Stanford Primary II (Form X) Language
Stanford Primary II (Form X) Computation
Stanford Primary II (Form X) Concepts
Self-Concept Rating
Attendance

Independent Variables (October 1971)

Stanford Primary I (Form W) Paragraph Meaning
Stanford Primary I (Form W) Word Reading
Stanford Primary I (Form W) Vocabulary
Stanford Primary I (Form W) Computation
Self-Concept Rating

2. Presentation of Findings[1,2]

The following findings were summarized from the analysis:

- Differences attributed to school were highly significant ($p<.001$).
- Differences attributed to teacher were highly significant ($p<.05$ to $p<.0001$).
- Differences attributed to preschool experiences were highly significant ($p<.01$).
- Differences attributed to economic status were highly significant ($p<.01$).
- Differences attributed to the interaction effects of economic status x preschool experiences were highly significant ($p<.01$).

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[1] Multivariate and Stepdown F-values were based on mean scores adjusted for unequal number of cases and effects of five pre-test measures (Stanford I subtests and self-concept rating).

[2] Mean scores presented in the subsequent tables represent adjusted scores. Refer to Tables B-6 to B-9 in Appendix B for real scores.

a. Findings - Multivariate Analysis

Controls Vs. Follow-Through at Second Grade

This discussion will attempt to respond to the following question: Did Second Grade Follow-Through children show significantly higher level of achievement and attendance than did the control children?

Table 12 indicates that the control children showed significantly higher performance on achievement measures than did the Follow-Through children.

TABLE 12

ADJUSTED MEAN SCORES AND STEPDOWN F-VALUES
BY VARIABLE BY TREATMENT GROUP*

Dependent Variable	Control	Follow-Through	Stepdown F-Values
Stanford II Paragraph Meaning	21.71	16.68	14.71**
Stanford II Word Meaning	13.60	12.00	0.43
Stanford II Language	27.86	26.66	0.97
Stanford II Computation	18.90	16.08	0.53
Stanford II Concepts	14.56	13.82	0.41
Self-Concept Rating	3.41	3.29	0.01
Attendance	170.60	163.70	9.32***

* Multivariate F = 3.11, $p < .001$
** $p < .0001$
*** $p < .001$

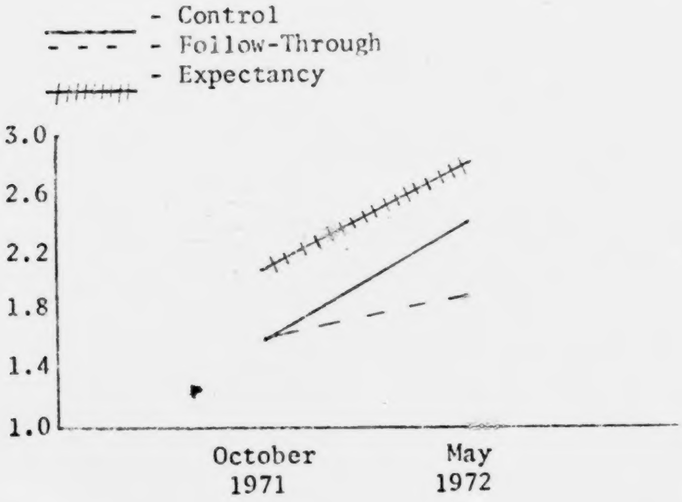
- Overall group difference was highly significant ($p < .001$) in favor of control children.

- Two out of seven dependent variables contributed significantly to the overall group difference: Control children evidenced significantly higher level of comprehension (Paragraph Meaning) and attendance than did Follow-Through children.

Pictorial illustration of performance on Paragraph Meaning subtest in Grade Equivalent score units indicated that control children evidenced larger growth in comprehension skills than did Follow-Through children over a nine-month period.

FIGURE 1

MEAN PERFORMANCE ON PARAGRAPH MEANING SUBTEST
IN GRADE EQUIVALENT UNITS



	October 1971	May 1972
Control	1.6	2.4
Follow-Through	1.6	1.9
Expectancy	2.1	2.8

- Although Follow-Through and control children were functioning at a comparable level in October 1971, marked growth over time among control children resulted in higher level of comprehension skills in May 1972.
- Both groups appeared to function below expectancy, with Follow-Through children demonstrating performance markedly below expectancy.

Differences Between Teachers Within Control and Follow-Through School

This discussion will attempt to respond to the following question: Were there differences in performance between classes at each school?

Analysis of classroom performance on the seven dependent variables as one measure of teacher effect indicated that four out of five teacher comparisons were significant ($p < .01$ to $p < .0001$).

TABLE 13

SUMMARY OF MULTIVARIATE F-VALUES FOR TEACHER COMPARISONS BASED ON SEVEN DEPENDENT VARIABLES

Teacher Comparisons	Teacher Holding Advantage	Multivariate F-Value	p
Control			
A Vs. C	A	7.90	$p < .0001$
B Vs. C	B	2.94	$p < .01$
Follow-Through			
D Vs. G	G	8.91	$p < .0001$
E Vs. G	E	4.21	$p < .001$
F Vs. G	G	2.01	Not significant

When teachers were ranked according to classroom achievement from highest to lowest, the following was noted:

- Control School

  Teacher A
  Teacher B
  Teacher C

- Follow-Through School

  Teacher E
  Teachers G and F
  Teacher D

TABLE 14

ADJUSTED MEAN SCORES AND STEPDOWN F-VALUES: TEACHER A VS. C AT CONTROL SCHOOL AT SECOND GRADE

Dependent Variable	Teacher A	Teacher C	Stepdown F
Stanford II Paragraph Meaning	27.51	20.30	31.85*
Stanford II Word Meaning	16.98	12.84	7.30**
Stanford II Language	30.73	26.64	3.77***
Stanford II Computation	18.31	20.38	0.47
Stanford II Concepts	17.94	13.94	7.08**
Self-Concept Rating	3.55	3.19	0.13
Attendance	169.20	170.60	0.03

* $p < .0001$
** $p < .001$
*** $p < .05$

- Overall group difference was highly significant ($p < .0001$) in favor of Teacher A.

- Four out of seven dependent variables contributed significantly to the overall group difference: Control class under Teacher A evidenced higher level of basic reading (Paragraph and Word Meaning) and language skills (Language), as well as in fundamental number concepts (Concepts) than did the class under Teacher C.

TABLE 15

ADJUSTED MEAN SCORES AND STEPDOWN F-VALUES: TEACHER B VS. C AT CONTROL SCHOOL AT SECOND GRADE*

Dependent Variable	Teacher B	Teacher C	Stepdown F
Stanford II Paragraph Meaning	18.71	20.30	2.27
Stanford II Word Meaning	11.74	12.84	0.45
Stanford II Language	27.43	26.64	0.15
Stanford II Computation	16.53	20.38	1.21
Stanford II Concepts	12.40	13.94	0.38
Self-Concept Rating	3.73	3.19	15.61**
Attendance	172.20	170.60	0.16

* $p < .01$
** $p < .0001$

- Overall group difference was highly significant ($p < .01$) in favor of Teacher B.

- However, only one out of the seven dependent variables contributed significantly to the overall group difference: Higher Self-Concept Ratings of Teacher B may reflect teacher bias. Thus, overall group differences between these two teachers could be easily ignored.

TABLE 16

ADJUSTED MEAN SCORES AND STEPDOWN F-VALUES: TEACHER D VS. G IN FOLLOW-THROUGH SCHOOL AT SECOND GRADE

Dependent Variable	Teacher D	Teacher G	Stepdown F
Stanford II Paragraph Meaning	15.75	17.77	0.06
Stanford II Word Meaning	7.53	13.08	32.03*
Stanford II Language	27.59	23.05	0.53
Stanford II Computation	13.13	19.59	2.31
Stanford II Concepts	12.07	15.96	2.25
Self-Concept Rating	3.21	3.46	0.70
Attendance	154.50	165.10	18.65*

* $p < .0001$

- Overall group difference was highly significant ($p < .0001$) in favor of Teacher G.
- Two out of seven dependent variables contributed significantly to the overall group difference: Follow-Through class under Teacher G demonstrated higher level of decoding skills (Word Meaning), and attendance than did the class under Teacher D.

No Preschool Vs. Preschool Experience

This discussion will attempt to respond to the following question: Were there significant differences in achievement and in attendance between children with and without preschool experiences at second grade Follow-Through and control classes?

Table 17 indicated that differences between the two groups were highly significant ($p < .01$) with the most evident difference noted in computational skills:

TABLE 17

ADJUSTED MEAN SCORES AND STEPDOWN F-VALUES: NO PRESCHOOL VS. PRESCHOOL EXPERIENCE AT SECOND GRADE*

Dependent Variable	No Preschool	Preschool	Stepdown F
Stanford II Paragraph Meaning	18.84	19.55	0.10
Stanford II Word Meaning	13.16	12.44	0.43
Stanford II Language	26.37	27.75	1.53
Stanford II Computation	19.74	15.24	7.29**
Stanford II Concepts	13.32	15.06	4.81***
Self-Concept Rating	3.41	3.29	3.88***
Attendance	166.30	168.00	0.60

* Multivariate F = 2.78, $p < .01$
** $p < .01$
*** $p < .05$

- Overall group difference was highly significant ($p < .01$)
- However, three out of seven dependent variables contributed significantly to the overall group difference: Children with no preschool experience showed higher level of basic computational skills and higher self-concept than did children with preschool experiences. However, children with preschool experience demonstrated significantly higher level of basic math concepts than did children with no preschool experience.

Non-Poor Vs. Poor

This discussion will attempt to answer the following question: Were there significant differences in achievement between Poor and Non-Poor children?

Table 18 indicates that differences between the Poor and Non-Poor children were highly significant ($p < .01$), with the most evident difference noted in attendance.

TABLE 18

ADJUSTED MEAN SCORES AND STEPDOWN F-VALUES: NON-POOR VS. POOR AT SECOND GRADE*

Dependent Variable	Non-Poor	Poor	Stepdown F
Stanford II Paragraph Meaning	19.37	19.01	0.34
Stanford II Word Meaning	13.30	12.30	0.51
Stanford II Language	26.12	28.00	0.38
Stanford II Computation	16.92	18.06	2.35
Stanford II Concepts	15.14	13.24	1.39
Self-Concept Rating	3.36	3.35	1.39
Attendance	166.40	167.80	10.05**

* Multivariate F = 2.44, $p < .01$

** $p < .001$

- Overall group difference was highly significant ($p < .01$).
- Only one out of seven dependent variables contributed significantly to the overall group difference: Poor children evidenced higher level of attendance than did Non-Poor children.

Effects of Independent Variables on Achievement, Self-Concept, and Attendance

This discussion will attempt to respond to the following question: To what degree did the pre-test measures correlate with achievement, self-concept, and attendance measures? Which of the five pre-test measures appeared to be the best predictor of the dependent variables?

An overall significant degree of association between the two sets of dependent and independent variables was noted: Multivariate F = 3.79, $p < .0001$. Four out of the five pre-test measures (Paragraph Meaning, Word Meaning, Computation, and Self-Concept Rating) demonstrated a significant degree of correlation with the seven dependent variables, when the contribution of each covariate was analyzed independently.

A regression analysis of the seven dependent and five independent variables indicated the following key findings:

- Approximately 12.05% of the variance of the dependent variables may be attributed to the effects of the seven covariates.
- The seven covariates appeared to have the greatest influence on five out of the seven dependent variables, Paragraph Meaning, Word Meaning, Computation, Concepts, and Self-Concept Ratings.

Analysis of the independent contribution of the seven covariates (stepwise regression analysis) indicated the following findings:

- One out of five independent variables, Stanford I Vocabulary, showed no significant contribution to the variance of the seven dependent variables. The four covariates ranked according to their predictive ability were as follows:

- Stanford I Paragraph Meaning scores appeared to be the best predictor ($p < .0001$) of the seven dependent variables. The remaining three variables, ranked according to the strength of their predictive ability included:

Self-Concept Rating	$p < .001$
Stanford 1 Computation	$p < .01$
Stanford I Word Meaning	$p < .01$

b. Follow-Up Studies of Second Grade Pupils Over A Two-Year Period

This section will discuss two follow-up studies. The first study will report on the results of a follow-up of second grade Follow-Through and control children with complete test data, from kindergarten through second grade, over a two year period. The second study will discuss graphically the findings of a follow-up of mean performance of total Follow-Through and control groups over a two year period, 1970-1971, and 1971-1972.

Follow-Up of Follow-Through and Control Pupils with Complete Test Data: The report on the first follow-up study will be addressed to the following questions:

- What are the effects of sex, preschool experience, economic status, and Project participation on basic math and reading skills at the end of the second grade?
- At which period -- at the end of first grade vs. end of second grade -- were group differences, if any, most evident?
- Which particular skill reflected the most significant group differences?

A Sex x Economic Status x Preschool Experience x Treatment (2 x 2 x 2 x 2) Multivariate Analysis of Covariance Design served as the basic model. Two analyses runs were made as performance in May 1971 and in May 1972 were analyzed.

The following served as covariates or independent variables:

Stanford I (X): September 1971
  Paragraph Meaning
  Word Reading
  Vocabulary
  Arithmetic

Metropolitan Readiness Tests Total Score - May 1970

PLR (IQ), Kuhlmann-Anderson (B) - November 1971

Mobility

The dependent variables for the two analyses runs consisted of performance on the following measures:

- First Run: Stanford I (W) in May 1971

  Paragraph Meaning
  Word Reading
  Vocabulary
  Arithmetic

- Second Run: Stanford II (X) in May 1972

  Paragraph Meaning
  Word Meaning
  Language
  Computation
  Concepts

Findings

- Differences attributed to Treatment were highly significant in analyzing performance at the end of first grade and at the end of second grade.
- Differences attributed to Sex, Economic Status, and Preschool Experiences were not significant.
- The best predictors of achievement at the end of first and second grade consisted of scores on Paragraph Meaning (September 1970), Metropolitan Readiness Tests Total Score, and Kuhlmann-Anderson PLR measures.

Control Vs. Follow-Through: At the end of first grade, overall group difference between Control and Follow-Through children was highly significant ($F = 22.30$, $p < .0001$). Table 19 below summarizes the stepdown F-values for the four variables.[1]

TABLE 19

ADJUSTED MEAN SCORES AND STEPDOWN F-VALUES FOR CONTROL AND FOLLOW-THROUGH CHILDREN BY VARIABLE AT THE END OF FIRST GRADE

Stanford I (X) Subtest	Control	Follow-Through	Stepdown F
Paragraph Meaning	17.32	11.79	17.97*
Word Reading	24.95	14.00	53.23*
Vocabulary	16.13	15.29	3.16
Arithmetic	32.58	30.50	2.43

* $p < .0001$

- Overall group difference was highly significant ($p < .0001$) in favor of the control group.

- Two out of the four dependent variables contributed significantly to the overall group difference: Control children evidenced significantly higher level of word analysis independent of its context (Word Reading) and comprehension (Paragraph Meaning) than did the Follow-Through children.

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[1] Refer to Tables B-10 and B-11 in Appendix B for real scores.

At the end of the second grade one year later, significant overall group difference was again noted in favor of control children. A Multivariate F-Value of 5.02 ($p < .0004$) was noted. However, differences at this time did not appear to be as great as those noted a year earlier.

TABLE 20

ADJUSTED MEAN SCORES AND STEPDOWN F-VALUES FOR CONTROL AND FOLLOW-THROUGH CHILDREN BY VARIABLE AT THE END OF SECOND GRADE*

Stanford II (X) Subtest	Control	Follow-Through	Stepdown F
Paragraph Meaning	24.27	15.95	23.93**
Word Meaning	15.06	11.97	0.50
Language	28.32	25.53	1.00
Computation	17.14	16.31	0.23
Concepts	14.84	13.41	0.01

* $p < .0004$
** $p < .0001$

- Overall group difference was significant in favor of the control group.
- Only one out of five variables contributed significantly to the overall group difference: Control children evidenced significantly higher level of comprehension skills (Paragraph Meaning) than did the Follow-Through children.

Follow-Up of Mean Performance Over A Two-Year Period at Second Grade: This discussion will be limited only to a descriptive analysis of mean performance in Grade Equivalent Units on Word Reading and Paragraph Meaning subtests, as these subtests were available for both Stanford Primary I and II tests. The report will cover a two-year follow-up, 1970-1971, 1971-1972, based on group data.[1]

This report will attempt to respond to the following questions:

- To what degree was the group performance deviating from expectancy over a two-year period?
- At what year were group differences most evident?

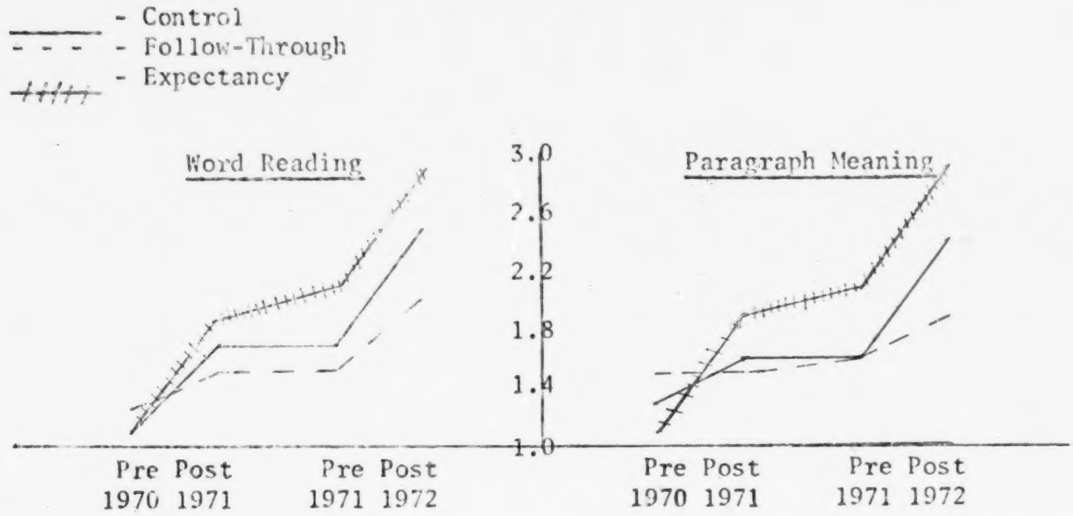
Graphical analysis of mean performance of Follow-Through and control groups at the end of second grade over a two-year period (1970-1971 and 1971-1972) indicated increasing differences in basic reading skills, favoring the control children (Figure 2).

---

[1] Group data pertains to data for a treatment group, not for pupils with complete test data.

FIGURE 2

MEAN PERFORMANCE IN GRADE EQUIVALENT UNITS ON WORD READING AND PARAGRAPH MEANING SUBTESTS FOR FOLLOW-THROUGH AND CONTROL SECOND GRADE CHILDREN OVER A TWO-YEAR PERIOD



	Pre 1970	Post 1971	Pre 1971	Post 1972	Pre 1970	Post 1971	Pre 1971	Post 1972
Control	1.1	1.7	1.7	2.5	1.3	1.6	1.6	2.4
Follow-Through	1.3	1.5	1.5	2.0	1.5	1.5	1.6	1.9
Expectancy	1.1	1.9	2.1	2.9	1.1	1.9	2.1	2.9

- Children in either group appeared to be functioning at expectancy range at entry to first grade.

- Both groups were functioning at comparable level at entry to first grade. However, increasing differences were noted over time, with Follow-Through children showing increasingly poorer performance.

- At the end of second grade, both groups were functioning below expectancy range.

D. Evaluation of 1971-1972 Third Grade Follow-Through Project

The evaluation report of the 1971-1972 Third Grade Follow-Through Project will attempt to respond to the following questions:

- Did Third Grade Follow-Through children show significantly higher level of basic achievement skills and attendance than did the comparable control group?
- Were there factors other than Follow-Through experience which were exercising some influences on children's performance?
- What was the nature of the test instrument (Stanford Primary II) which was used to evaluate basic skills of children in the Project?

1. Design

A five-factorial multivariate analysis of covariance cross-nested design (Sex x Economic Status x Preschool Experience x School x Teacher Nested in School) served as the basic design:

Sex
- Girl
- Boy

Economic Status[1]
- Non-Poor
- Poor

Preschool Experience
- No Preschool Experience
- With Preschool Experience

School
- Control
- Follow-Through

---

[1] Identification of Non-Poor and Poor children was based on eligibility criteria for the free federal lunch program. Data was available from the child's permanent record card.

Teacher

- A
- B Control
- C

- D
- E Follow-Through
- F
- G

Dependent Variables (May 1972)

Stanford Primary II (Form W) Paragraph Meaning
Stanford Primary II (Form W) Word Meaning
Stanford Primary II (Form W) Language
Stanford Primary II (Form W) Computation
Stanford Primary II (Form W) Concepts
Self-Concept Rating
Attendance

Independent Variables

Metropolitan Readiness Tests Total Score (May 1969)
PLR score based on Kuhlmann-Anderson CD - October 1971
Stanford Primary II (Form X) Paragraph Meaning (October 1971)
Stanford Primary II (Form X) Word Meaning (October 1971)
Stanford Primary II (Form X) Language (October 1971)
Stanford Primary II (Form X) Computation (October 1971)
Stanford Primary II (Form X) Concepts (October 1971)
Self-Concept Rating
Chronological Age
Mobility

2. Presentation of Findings[1]

- Differences attributed to school were highly significant ($p < .0001$).

- Differences attributed to teacher were highly significant ($p < .004$ to $p < .0001$).

- Differences attributed to sex, economic status, and to preschool experience were not significant.

- Differences attributed to interaction effects of economic status, preschool experience, and school factors were significant ($p < .001$).

---

[1] Multivariate and Stepdown F-values were based on mean scores adjusted for unequal N and effects of covariates. Mean scores in the subsequent tables represent adjusted scores. Refer to Tables B-12 to B-14 in Appendix B for real scores.

a. Findings - Multivariate Analysis

Controls Vs. Follow-Through at Third Grade

This discussion will attempt to respond to the following question: Did Third Grade Follow-Through children show significantly higher level of basic achievement skills and attendance than did the control groups? Were there factors other than Follow-Through experiences which were exercising some influences on children's performance?

Table 21 indicates that overall group difference between the two groups was highly significant $(p < .001)$.

TABLE 21

ADJUSTED MEAN SCORES AND STEPDOWN F-VALUES: CONTROL
VS. FOLLOW-THROUGH SCHOOL AT THIRD GRADE*

Dependent Variable	Control	Follow-Through	Stepdown F
Stanford II Paragraph Meaning	29.37	25.34	8.39**
Stanford II Word Meaning	15.92	17.36	7.09**
Stanford II Language	33.37	31.99	0.91
Stanford II Computation	30.93	25.16	6.89***
Stanford II Concepts	19.52	18.38	0.16
Self-Concept Rating	3.11	3.04	0.06
Attendance	166.50	165.10	0.01

* Multivariate F = 3.45, $p < .001$
** $p < .001$
*** $p < .01$

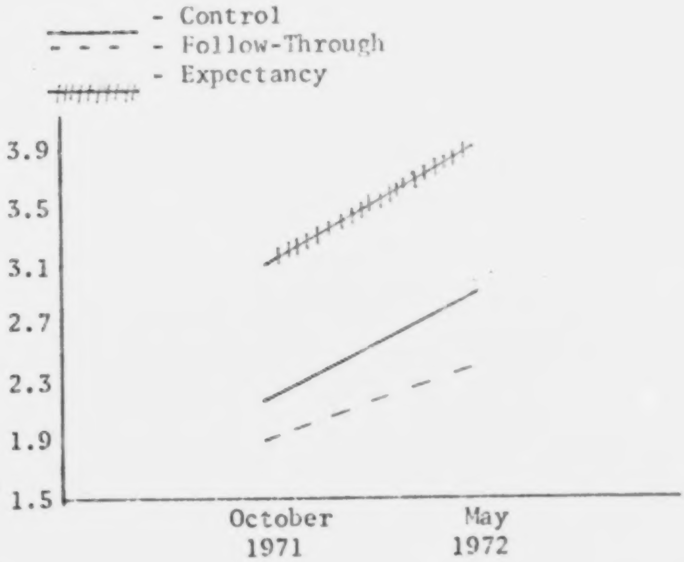
- Overall group difference was highly significant $(p < .001)$ in favor of control children.

- Three out of six dependent variables contributed significantly to the overall group difference: Control children evidenced a better level of comprehension (Paragraph Meaning) and basic computational skills (Computation) than did Follow-Through children. However, Follow-Through children evidenced significantly higher level of word analysis skills (Word Meaning) than did control children.

Pictorial comparison of performance on Paragraph Meaning (Figure 3) in grade equivalent score units indicated that control children showed significantly higher level of performance than did Follow-Through children at the beginning and at the end of the school year.

FIGURE 3

MEAN PERFORMANCE ON PARAGRAPH MEANING SUBTEST IN GRADE EQUIVALENT UNITS IN OCTOBER 1971 AND IN MAY 1972



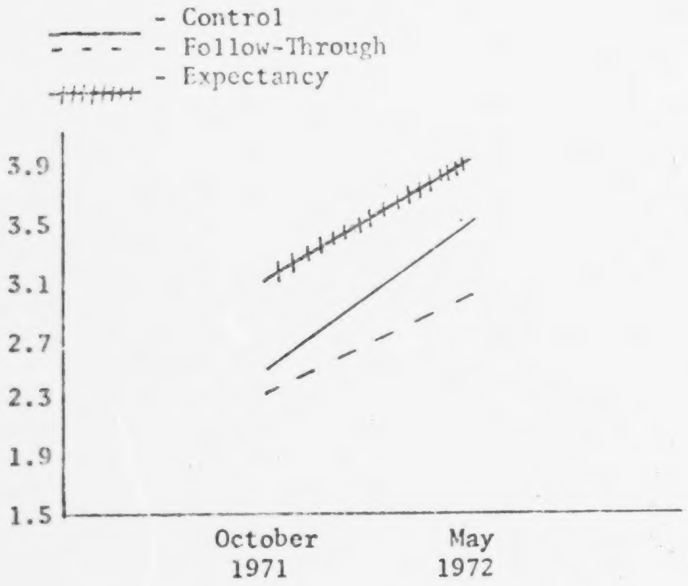
Control	2.2	2.9
Follow-Through	1.9	2.4
Expectancy	3.1	3.9

- Control children's superior level of comprehension skills appeared to be a function of higher level of performance at the beginning of the school year.
- Both groups continued to function below expectancy level.

On Computation subtest, control children (Figure 4) demonstrated significantly higher level of performance as compared to Follow-Through children.

FIGURE 4

MEAN PERFORMANCE ON COMPUTATION SUBTEST IN GRADE EQUIVALENT UNITS IN OCTOBER 1971 AND IN MAY 1972



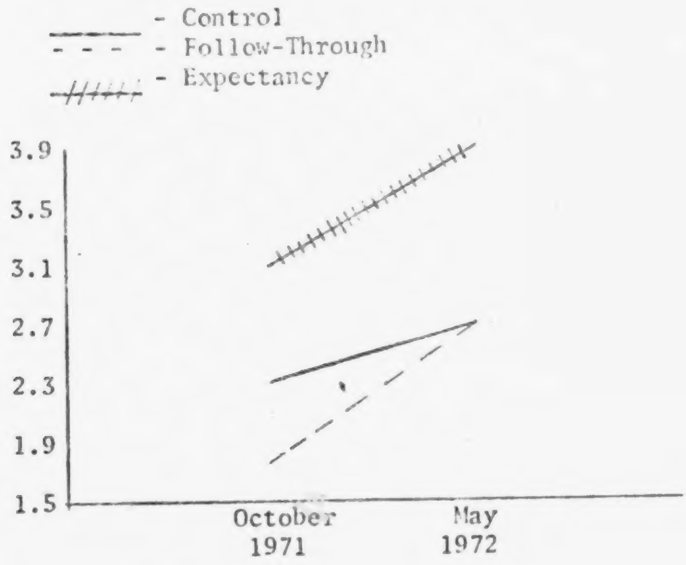
Control	2.5	3.5
Follow-Through	2.3	3.0
Expectancy	3.1	3.9

- Control children evidenced significantly higher level of gains over a nine-month period than did Follow-Through children. The controls evidenced a mean gain of one year in computational skills over a nine-month period as compared to gains of seven months for Follow-Through children over the same period.

On Word Meaning subtest, Follow-Through children demonstrated significantly higher gains over a nine month period as compared to control children (Figure 5).

FIGURE 5

MEAN PERFORMANCE ON WORD MEANING SUBTEST IN GRADE EQUIVALENT UNITS IN OCTOBER 1971 AND IN MAY 1972



Control	2.3	2.7
Follow-Through	1.8	2.7
Expectancy	3.1	3.9

- Follow-Through and control children were functioning at comparable levels at the end of the third grade, although control children showed a higher level of performance at entry. Follow-Through children evidenced a mean gain of nine months, as compared to the four months gain of control children over a nine month period.

Differences Between Teachers Within Control and Follow-Through Schools

This discussion will attempt to respond to the following question: Were there differences in performance between classrooms in a given school at the third grade level?

Table 22 indicates that teacher differences within the control school were highly significant ($p < .05$ to $p < .0001$). However, teacher differences at the Follow-Through school did not approach significance level.

TABLE 22

SUMMARY OF MULTIVARIATE F-RATIO TESTS FOR TEACHER COMPARISONS BASED ON SEVEN DEPENDENT VARIABLES

Teacher Comparisons	Teacher Holding Advantage	Multivariate F-Ratio	p
Control School			
A Vs. C	A	2.12	$p < .05$
B Vs. C	B	8.50	$p < .0001$
Follow-Through School			
D Vs. G	--	1.54	N.S.*
E Vs. G	--	1.11	N.S.*
F Vs. G	--	1.35	N.S.*

* N.S. - no significant difference

When teachers were ranked according to classroom achievement from highest to lowest, the following observations were noted:

Control School
- Teacher B
- Teacher A and C

Follow-Through School
- All comparable

The following two tables summarize the comparisons of individual pairs of teachers within the control school which resulted in significant differences.

TABLE 23

ADJUSTED MEAN SCORES AND STEPDOWN F-VALUES FOR TEACHER COMPARISONS AT CONTROL SCHOOL AT THIRD GRADE: TEACHER A VS. C (A), TEACHER B VS. C (B)

A. TEACHER A VS. C

Dependent Variable	Teacher A	Teacher C	Stepdown F
Stanford II Paragraph Meaning	26.62	30.24	2.25
Stanford II Word Meaning	17.20	14.13	2.20
Stanford II Language	31.72	31.19	2.14
Stanford II Computation	31.94	28.09	1.01
Stanford II Concepts	18.31	19.73	1.91
Self-Concept Rating	3.33	3.14	4.45*
Attendance	169.70	168.20	0.55

* $p < .05$

- Overall group difference was highly significant ($p < .05$) in favor of Teacher A.

- However, only one out of seven variables contributed significantly to the overall group difference: Higher self-concept ratings of Teacher A may reflect teacher bias. Thus overall group differences between these two teachers could be ignored.

B. TEACHER B. VS. C*

Dependent Variable	Teacher B	Teacher C	Stepdown F
Stanford II Paragraph Meaning	30.38	30.24	0.53
Stanford II Word Meaning	18.20	14.13	7.18**
Stanford II Language	39.40	31.19	17.13*
Stanford II Computation	35.61	28.09	9.12***
Stanford II Concepts	20.32	19.73	0.92
Self-Concept Rating	2.82	3.14	13.32***
Attendance	160.50	168.20	3.35

* $p < .0001$
** $p < .01$
*** $p < .001$

- Overall group difference was highly significant ($p < .0001$) in favor of Teacher B.

- Four out of seven dependent variables contributed significantly to the overall group difference: Children under Teacher B evidenced a higher level of decoding skills (Word Meaning), language grammar and usage (Language), and basic computational skills (Computation). However, children under Teacher C tended to receive higher self-concept ratings than did the higher-achieving children under Teacher B.

Economic Status x Preschool Experience x Treatment

This discussion will attempt to respond to the following question: Were there significant differences in achievement and in attendance which could be attributed to the significant interaction effects of economic status, preschool, and treatment experiences at third grade?

Table 24 indicated that significant interaction effects were present ($p < .01$).

TABLE 24

ADJUSTED MEAN SCORES AND STEPDOWN F-VALUES FOR ECONOMIC STATUS X PRESCHOOL X TREATMENT EXPERIENCES*

	Control				Follow-Through				
	Non-Poor		Poor		Non-Poor		Poor		
Dependent Variable	No Pre-school	Pre-school	No Pre-school	Pre-school	No Pre-school	Pre-school	No Pre-school	Pre-school	Step-down F
Stanford II Paragraph Meaning	31.93	27.89	28.98	28.69	24.97	26.77	24.10	25.50	0.82
Stanford II Word Meaning	16.40	15.81	16.86	14.59	18.16	16.94	17.15	17.20	2.26
Stanford II Language	38.10	32.14	31.33	31.49	31.78	35.68	30.98	29.51	6.32**
Stanford II Computation	33.26	31.24	31.16	28.08	26.28	26.68	22.77	24.93	0.49
Stanford II Concepts	20.56	18.23	19.65	19.64	19.01	17.49	18.39	18.61	0.11
Self-Concept Rating	3.24	3.09	3.09	3.02	3.11	3.08	3.15	2.83	1.82
Attendance	157.40	173.80	166.30	168.50	165.30	163.10	162.30	169.70	3.95**

* Multivariate F = 2.62, $p < .01$

** $p < .01$

- Overall group difference was highly significant ($p < .01$).
- Two out of seven dependent variables contributed to the overall significant difference: Language and Attendance.

Effects of Independent Variables on Achievement, Self-Concept, and Attendance

This discussion will attempt to respond to the following question: To what degree did the pre-test measures correlate with achievement, self-concept, and attendance measures? Which of the ten pre-test measures appeared to be the best predictors of the dependent variables?

An overall significant degree of association between the two sets of dependent and independent variables was noted: Multivariate F = 3.25, $p < .0001$. Eight out of the ten pre-test measures (Metropolitan Readiness Tests Total Score, PLR, Paragraph Meaning, Word Meaning, Computation, Concepts, Self-Concept Rating, and Chronological Age) demonstrated a significant degree of correlation with the seven dependent variables, when the contribution of each covariate was analyzed independently.

A regression analysis of the seven dependent and ten independent variables indicated the following key findings:

- Approximately 18.36% of the variance of the dependent variables may be attributed to the effects of the seven covariates.
- The seven covariates appeared to have the greatest influence on five out of the seven dependent variables including Paragraph Meaning, Word Meaning, Computation, Concepts, and Attendance.

Analysis of the independent contribution of the seven covariates (stepwise regression analysis) indicated the following findings:

- Two out of the ten independent variables showed no significant contribution to the variance of the seven dependent variables. These variables included Language and Mobility.

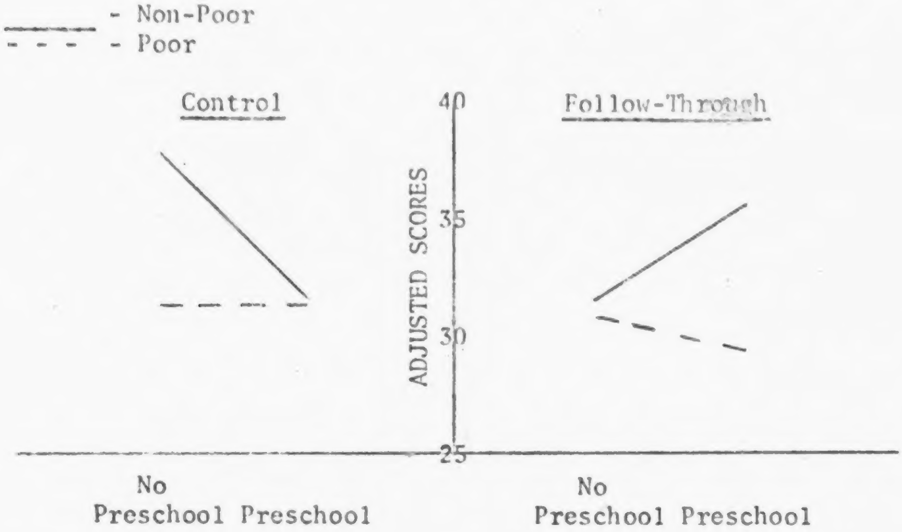
- Stanford II Paragraph Meaning and Computation scores appeared to be the best predictors of the seven dependent variables. The remaining six covariates ranked according to the strength of their predictive ability were as follows:

Concepts	$p < .001$
Self-Concept Rating	$p < .003$
Word Meaning	$p < .02$
PLR	$p < .04$
Metropolitan Readiness Tests	$p < .02$
Chronological Age	$p < .03$

Pictorial illustration of the interaction effects on language skills indicated that the influence of economic status and preschool experiences varied for Follow-Through and control children (Figure 6).

FIGURE 6

PROFILES OF INTERACTION EFFECTS OF ECONOMIC STATUS
X PRESCHOOL X TREATMENT ON LANGUAGE SUBTEST



	No Preschool	Preschool	No Preschool	Preschool
Non-Poor	38.10	32.14	31.78	35.68
Poor	31.33	31.49	30.98	29.51

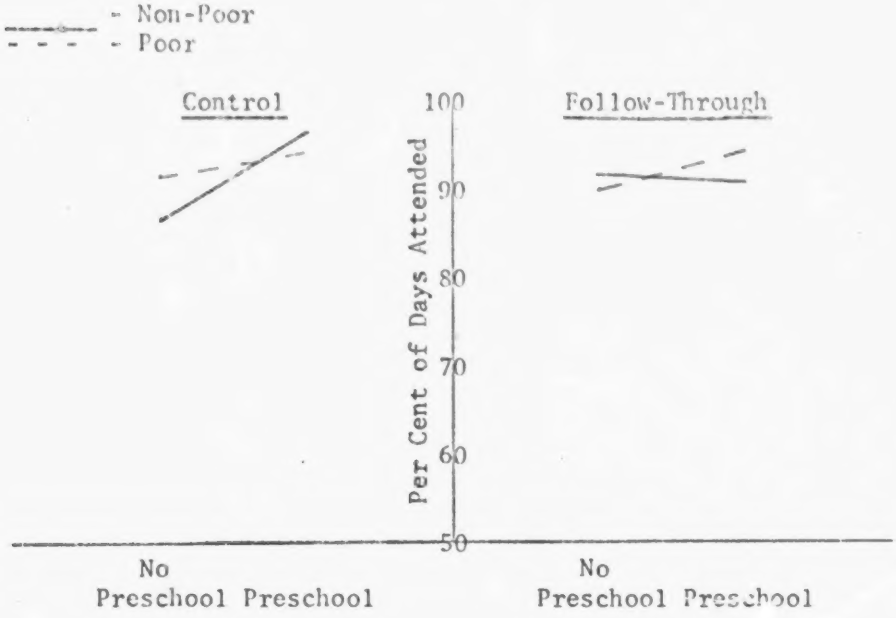
- In Follow-Through classes, preschool experiences appeared to have a positive impact on language performance of Non-Poor children. The reverse was noted in the control school, where absence of preschool experiences among Non-Poor children tended to result in higher language scores.

- In both schools, Poor children functioned at a comparable level, regardless of whether they had preschool experience or not.

Graphical analysis of similar interaction effects for attendance measures in per cent indicated varying influences for Follow-Through and control classes (Figure 7).

FIGURE 7

PROFILES OF ECONOMIC STATUS X PRESCHOOL EXPERIENCE X TREATMENT ON ATTENDANCE



	No Preschool	Preschool	No Preschool	Preschool
Non-Poor	87%	97%	92%	91%
Poor	92%	94%	90%	94%

- In Follow-Through classes, preschool experiences' positive effect on attendance was limited to Poor children. In control classes, the effect of preschool experiences was evident among both Poor and Non-Poor children, but the strongest influence was noted among Non-Poor children.

- Differences in attendance were most evident among Non-Poor and Poor children with no preschool experiences in control classes. In Follow-Through classes, the differences were noted among Non-Poor and Poor children with preschool experiences.

b. Follow-Up Studies of Third Grade Pupils Over A Two-Year Period

This section will discuss two follow-up studies. The first study will report on the results of a follow-up of Third Grade Follow-Through and control children with complete test data on Stanford Primary II tests from second through third grade, over a two year period. The second study will discuss graphically the findings of a follow-up of mean performance of total Follow-Through and control groups over a two year period, 1970-1971, and 1971-1972.

Follow-Up of Follow-Through and Control Pupils with Complete Test Data: The report on the first follow-up study will be addressed to the following questions:

- What are the effects of sex, preschool experience, economic status, and Project participation on basic math and reading skills at the end of the second grade?
- At which period -- at the end of first grade vs. end of second grade -- were group differences, if any, most evident?

A Sex x Economic Status X Preschool Experience x Treatment (2 x 2 x 2 x 2) Multivariate Analysis of Covariance Design served as the basic model. Two analyses runs were made as performance in May 1971 and in May 1972 were analyzed.

The following served as covariates or independent variables:

Stanford II (X): September 1970
  Paragraph Meaning
  Word Meaning
  Language
  Computation
  Concepts

PLR (IQ), Kuhlmann-Anderson (C) - November 1971

Metropolitan Readiness Tests Total Score - May 1969

Chronological Age

Mobility

The dependent variables for the two analyses runs consisted of performance on the following measures:

- First Run: Stanford II (W) in May 1971

  Paragraph Meaning
  Word Meaning
  Language
  Computation
  Concepts

- Second Run: Stanford II (W) in May 1972

  Paragraph Meaning
  Word Meaning
  Language
  Computation
  Concepts

Findings[1]

- Differences attributed to Sex, Economic Status, Preschool, and Treatment Experiences at the end of their second grade year were not significant.
- Differences attributed to Economic Status, Preschool, and Treatment Experiences at the end of their third grade year were not significant.
- Differences attributed to Sex at the end of their third grade year were significant.
- The best predictors of achievement at the end of second and third grades consisted of Language and Computation (September 1970).

---

[1] Refer to Tables B-15 and B-16 in Appendix B for real scores.

Control Vs. Follow-Through: Overall group differences between control (N=26) and Follow-Through children (N=34) at the end of second grade and at the end of third grade were non-significant.

Girls Vs. Boys: Overall group difference between Girls (N=32) and Boys (N=28) at the end of the third grade was highly significant (Multivariate F = 3.13, $p < .02$). This finding was not evident a year earlier (Multivariate F = .93, $p < .48$).

TABLE 25

ADJUSTED MEAN SCORES AND STEPDOWN F-VALUES FOR GIRLS AND BOYS BY VARIABLE AT THE END OF THIRD GRADE*

Stanford II (W) Subtest	Girls	Boys	Stepdown F
Paragrpah Meaning	26.51	25.73	0.67
Word Meaning	16.93	16.95	0.43
Language	34.05	33.81	0.50
Computation	28.46	27.79	0.06
Concepts	16.79	21.13	13.45**

* $p < .02$
** $p < .001$

- Overall group difference was significant in favor of Boys.
- Only one out of five variables contributed significantly to the overall group difference: Boys evidenced significantly higher level of functioning on Concepts than did Girls.

E. Ratings of Follow-Through Teachers, Kindergarten to Third Grade on A Local Responsive Classroom Rating Scale

This discussion will attempt to respond to the following questions: To what degree were principles of the Responsive Classroom Environment program implemented? Were there differences between the four grades in the implementation of these principles? Were there relationships between scale ratings and duration of Project-teaching experience? Were there relationships between scale ratings and class achievement?

A seven-point rating scale was developed jointly by the Project administrative staff and the Division of Research and Development to assess the degree of implementation of the 'Responsive' classroom program. (Refer to complete copy in Appendix C). The rating scale consisted of nine behavior categories, identified to be related to the principle embodied in the 'autotelic responsive environment.' The rating scale was completed by the Project administrative staff who consisted of the Assistant Program Manager, and the two Program Advisors at the close of the 1971-1972 school year.

The four grades were compared with one another on the basis of mean ratings. Mean ratings and mean ranks of teachers were analyzed in terms of their relationships to Project teaching experience and achievement. Mean ratings and mean ranks were obtained as follows:

- Mean rating for each teacher was obtained by averaging the ratings received for each behavior category.

- Mean rating for each grade was obtained by averaging the teacher's individual mean rating within a given grade.

- Mean rank for each teacher was obtained first, by ranking teachers within a given grade in a designated order with rank four for the teacher with the highest rating, and rank 1 for the teacher with the lowest rating for each category. Then, the teacher's individual mean rank was averaged across the nine behavior categories, to yield a mean rank.

1. Mean Ratings By Grade Level

Mean ratings per category for each grade level are presented in Figure 8. Analysis of the mean ratings indicated implementation of the 'responsive' principles from kindergarten through third grade. The following key findings were noted:

- Kindergarten classes appeared to be 'relatively' more 'responsive' compared to the three other grades. First grade classes appeared to be 'relatively' less 'responsive' compared to the three other grades.

- Utilization of the LEIR approach (#1) decreases as one goes up the grade level.

- The degree of participation among teachers in in-service sessions (#8) by grade level was generally comparable from grade to grade.

- The degree of teacher's verbal demeaning (threatening) behavior (#4) appeared to be strongly correlated with teacher's application of strong physical force (#6) to ensure classroom control.

- Application of methodological approaches for developing basic reading (#1) and math (#2) skills received lower ratings as compared to other more general approaches compatible with the Responsive Environment Principle.

2. Mean Ratings, Duration of Project Experience, and Their Effects on Achievement Rank Order

Table 26 summarizes by grade mean ratings and ranks based on the Responsive Classroom Rating Scale as well as duration of Project-teaching experience and the achievement rank order, based on the multivariate analysis of covariance analysis presented earlier.

TABLE 26

MEAN RATINGS AND RANKS OF FOLLOW-THROUGH TEACHERS BASED ON RESPONSIVE CLASSROOM RATING SCALE BY PROJECT EXPERIENCE BY ACHIEVEMENT RANK ORDER

Grade	Teacher	Years of Project Experience	Mean		Achievement Rank Order[2]
			Rating[1]	Rank[1]	
Kindergarten	A	2	5.44	1.39	2
	B	3	5.88	1.61	1
1	C	2	5.33	3.12	3
	D	3	4.44	2.28	4
	E	1	3.11	1.44	2
	F	1	5.11	3.16	1
2	G	1	2.77	2.22	1
	H	2	5.55	2.84	4
	I	1	4.77	2.16	2.5
	J	3	4.55	2.78	2.5
3	K	2	5.11	2.39	No difference
	L	1	5.00	1.88	
	M	2	5.55	3.01	
	N	1	5.33	2.72	

[1] Mean rating per teacher based on average of rating across nine behavior categories. Mean rank per teacher based on average of rank relative to other teachers per grade across nine categories.

[2] Based on overall classroom achievement per grade: 4 with highest achievement and 1 with lowest achievement. At kindergarten, ranks 2 and 1 as the high and low achievement respectively.

Table 26 indicates the following findings:

- Mean ratings for the two kindergarten and for the four third grade teachers showed the least variability.

- Mean ratings for the four second grade teachers showed the largest variability, with mean ratings ranging from 2.77 to 5.55

- Correlations between mean ratings (ranks) and achievement rank order revealed no consistent trends. Correlations based on Spearman rho ranged from 0 at first grade to -1.0 at kindergarten (r = 0.96 for second grade and 0.43 for third grade).

- Correlations between mean ratings and duration of Project teaching experience were extremely low for teachers at grades 1 to 3 (.10 to .20).

To summarize briefly, some correlations were noted between class achievement and mean ratings. The trends were not consistent across the four grade levels, as Spearman rho ranged from -1.0 at kindergarten to 0.0 at first grade. The high correlations at kindergarten may be a more biased estimate because only two kindergarten teachers were involved as compared to four teachers in the other grade levels.

When class achievement was correlated with duration of Project experience, correlations were consistently low from first to third grade. The high correlations noted at kindergarten may again be a function of the limited number of kindergarten teachers involved.

These findings strongly indicate that there are more critical variables operating on children's performance other than the degree of implementation of the responsive classroom program and the duration of Project teaching experience. It should be noted, however, that completion of the Responsive Classroom Rating Scale (which formed the basis of mean ratings) of the Project administrative staff may reflect some biases that may not be a valid assessment of the actual teacher's classroom behavior. The validity of the rating instrument itself, may also be of some question.

F. Evaluation of 1971-1972 Fourth Grade 'In Transition'

The evaluation report of the 1971-1972 Fourth Grade Transitional Project will attempt to respond to the following questions:

- Did Fourth Grade children 'in transition' show significantly higher level of basic achievement skills, attendance, and self-concept ratings than did the comparable control groups?
- Were there factors other than previous Follow-Through experience which were exercising some influences on children's performance?

1. Design

A five-factorial multivariate analysis of covariance cross-nested design (Sex x Economic Status x Preschool Experience x School x Teacher Nested in School) served as the basic design:

Sex
- Girl
- Boy

Economic Status[1]
- Non-Poor
- Poor

Preschool Experience
- No Preschool Experience
- With Preschool Experience

School (Treatment)
- Control School 1
- Control Schools 2A and B[2]
- Follow-Through

---

[1] Identification of Non-Poor and Poor children was based on eligibility criteria for the free federal lunch program. Data was available from child's permanent record card.

[2] Control Schools 2A and B were treated as one school in the analysis because of the high frequency of administrative transfers occurring between these two schools.

Teacher	
A B	Control School 1
C D	Control Schools 2A and 2B
E F	Fourth Grade Transitional

Dependent Variables

CTBS* Reading Comprehension (May 1972)
CTBS* Vocabulary (May 1972)
CTBS* Computation (May 1972)
CTBS* Concepts (May 1972)
CTBS* Application (May 1972)
Self-Concept Rating (May 1972)
Attendance

Independent Variables

CTBS* Reading Comprehension (November 1970)
CTBS* Vocabulary (November 1970)
CTBS* Computation (November 1970)
CTBS* Concepts (November 1970)
CTBS* Application (November 1970)
Stanford Diagnostic Reading (September 1970)
Metropolitan Readiness Tests Total Score (May 1968)
PLR (October 1970)
Self-Concept Rating (September 1971)
Chronological Age
Mobility

---

* Comprehensive Test of Basic Skills

2. Presentation of Findings[1,2]

The following findings were summarized from the analysis:

- Differences attributed to school were highly significant ($p < .01$).
- Differences attributed to teacher were highly significant ($p < .01$).
- Differences attributed to interaction effects of preschool x school experiences were highly significant ($p < .01$).
- The best predictors of achievement at the end of fourth grade included CTBS Reading Comprehension, Vocabulary, Computation, Concepts, and the Stanford Diagnostic Reading Test.

Controls Vs. Follow-Through at Fourth Grade

This discussion will attempt to respond to the following question: Did Fourth Grade children 'in transition' show significantly higher level of achievement, self-concept, and attendance measures than the two control groups?

Table 27 indicated that differences were highly significant when performance of Follow-Through children was compared with Control 2 children who were attending a 'non-comparable' Title I school which was socio-economically better than the Follow-Through school. However, when comparisons were made between Follow-Through and Control 1 children, who were attending a 'comparable' Title I school, differences were significant.

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[1] Multivariate F-values were based on mean scores adjusted for unequal number of cases and effects of 11 pre-test measures and demographic variables.

[2] Refer to Tables B-17 to B-19 in Appendix B for the real or mean scores.

TABLE 27

SUMMARY OF MULTIVARIATE F-VALUES FOR SCHOOL COMPARISONS BASED ON SEVEN DEPENDENT VARIABLES

School Comparisons	School Holding Advantage	Multivariate F	p
Control 1 Vs. Follow-Through	--	0.88	Not significant
Control 2 Vs. Follow-Through	Control 2	2.23	$p < .05$

Control 2 Vs. Follow-Through: Overall group differences between Control 2 and Follow-Through children were highly significant (Table 28).

TABLE 28

ADJUSTED MEAN SCORES AND STEPDOWN F-VALUES: CONTROL 2 VS. FOLLOW-THROUGH SCHOOL*

Dependent Variable	Control 2	Follow-Through	Stepdown F
CTBS Reading Comprehension	384.90	392.20	0.21
CTBS Vocabulary	363.60	361.90	0.02
CTBS Computation	391.50	376.70	1.89
CTBS Concepts	391.30	370.10	7.44**
CTBS Applications	379.00	374.60	0.77
Self-Concept Rating	3.06	3.29	2.67
Attendance	170.70	166.50	2.11

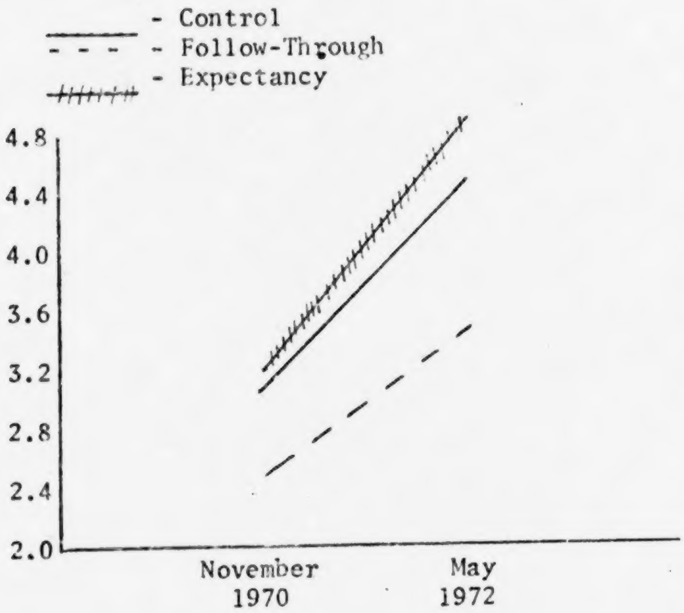
* $p < .05$
** $p < .01$

- Overall group differences were highly significant in favor of Control 2 children.
- Only one out of seven dependent variables contributed significantly to the overall group difference: Control 2 children evidenced significantly higher level of knowledge and application of appropriate concepts and techniques, and a higher level of comprehension of numerical concepts and their interrelationships (Concepts) than did the Follow-Through children.

Pictorial illustration of performance on CTBS Arithmetic Concepts in Grade Equivalent Units indicated that control children demonstrated larger gains than did Follow-Through children over an 18 month period.

FIGURE 8

MEAN PERFORMANCE ON CTBS ARITHMETIC CONCEPTS SUBTEST IN GRADE EQUIVALENT UNITS



Control 2	3.1	4.5
Follow-Through	2.5	3.5
Expectancy	3.2	4.9

Differences Between Teachers Within Control and Follow-Through Schools

This discussion will attempt to respond to the following question: Were there differences in performance between classes within each program?

Analysis of classroom performance on the seven dependent variables as one measure of teacher effect indicated significant teacher differences within Control 1 school. Teacher differences within Follow-Through and Control 2 schools did not meet significance.

TABLE 29

SUMMARY OF MULTIVARIATE F-VALUES FOR TEACHER COMPARISONS BASED ON SEVEN DEPENDENT VARIABLES

Teacher Comparisons	Teacher Holding Advantage	Multivariate F-Value	P
Control 1 School A Vs. B.	B	2.82	$p < .01$
Control 2 School C Vs. D	--	1.01	Not significant
Follow-Through School E Vs. F	E	2.80	$p < .01$

- Control 2 children evidenced significantly higher level of Arithmetic Concepts skills than did Follow-Through children at the beginning of third grade and towards the end of fourth grade. The initial lead of control children over that of Follow-Through children appeared to have been maintained 18 months later.

- Control 2 children were functioning within the expectancy range as compared to Follow-Through children who were functioning below expectancy.

Findings from these exploratory studies represented trends similar to earlier studies of the same three groups at kindergarten through third grade. The absence of mere differences between these children 'in transition,' and the two other control groups suggests that despite the initial chaos of Follow-Through in its initial years of implementation, these former Follow-Through children who constituted the very first group of Follow-Through graduates, did manage to learn.

Tables 30 and 31 summarize the comparisons of individual pairs of teachers within Control 1 and Follow-Through schools which resulted in significant differences.

TABLE 30

ADJUSTED MEAN SCORES AND STEPDOWN F-VALUES FOR TEACHER COMPARISONS AT CONTROL 1 SCHOOL AT FOURTH GRADE: TEACHER A VS. B*

Dependent Variable	Teacher A	Teacher B	Stepdown F
CTBS Reading Comprehension	340.80	390.60	11.79**
CTBS Vocabulary	350.90	374.70	0.76
CTBS Computation	389.50	386.20	1.32
CTBS Concepts	388.60	387.20	2.64
CTBS Applications	358.10	385.10	2.12
Self-Concept Rating	3.19	3.03	0.46
Attendance	170.00	168.80	0.44

* $p < .01$

** $p < .001$

- Overall group difference was highly significant in favor of Teacher B.

- One out of seven dependent variables contributed significantly to the overall group difference: Children under Teacher B evidenced significantly higher levels of symbols, sound-symbols, correspondence, interpretation, perceiving relationships, and drawing conclusions than did children under Teacher A.

TABLE 31

ADJUSTED MEAN SCORES AND STEPDOWN F-VALUES FOR TEACHER COMPARISONS AT FOLLOW-THROUGH SCHOOL AT FOURTH GRADE: TEACHER E VS. F*

Dependent Variable	Teacher E	Teacher F	Stepdown F
CTBS Reading Comprehension	416.20	368.30	11.39**
CTBS Vocabulary	372.00	351.90	0.88
CTBS Computation	370.60	382.80	1.28
CTBS Concepts	369.70	370.60	0.37
CTBS Applications	372.30	377.00	1.48
Self-Concept Rating	3.47	3.12	2.97
Attendance	166.80	166.10	0.93

* $p < .01$
** $p < .001$

- Overall group difference was highly significant in favor of Teacher E.
- One out of seven dependent variables contributed significantly to the overall group difference: Children under Teacher E evidenced significantly higher levels of symbols, sound-symbols, correspondence, interpretation, perceiving relationships, and drawing conclusions than did children under Teacher F.

Preschool Experience X Treatment

This discussion will attempt to respond to the following question: Were there significant differences in achievement and in attendance which could be attributed to the significant interaction effects of Preschool x Treatment at fourth grade?

Table 32 indicated that significant interaction effects were evident (p<.05).

TABLE 32

ADJUSTED MEAN SCORES AND STEPDOWN F-VALUES FOR PRESCHOOL X TREATMENT EXPERIENCES*

Dependent Variable	Control 2		Follow-Through		Stepdown F
	No Preschool	Preschool	No Preschool	Preschool	
CTBS Reading Comprehension	390.00	379.70	398.10	386.40	0.02
CTBS Reading Vocabulary	359.90	367.30	363.70	360.10	0.99
CTBS Computation	390.20	392.90	382.50	370.80	1.34
CTBS Concepts	400.50	382.20	372.50	367.70	3.57
CTBS Applications	382.70	375.20	374.40	374.90	0.65
Self-Concept Rating	2.93	3.18	3.29	3.30	0.36
Attendance	172.40	169.00	160.10	172.90	9.16**

* Multivariate F = 2.39, p<.05
** p<.001

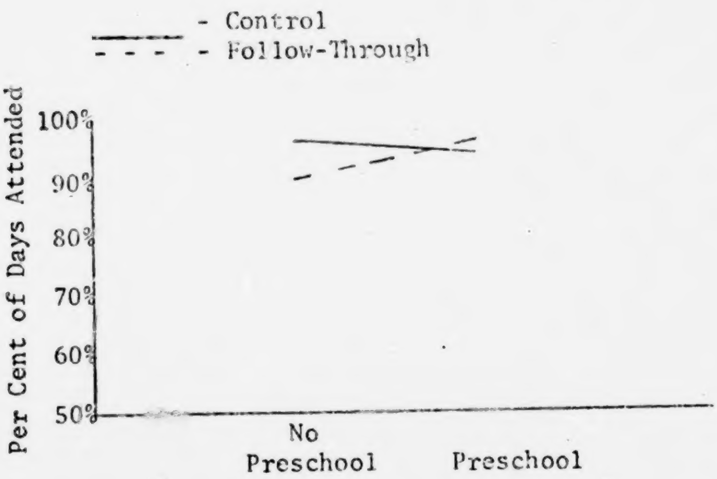
- Overall group difference was highly significant (p<.05).

- One out of seven dependent variables contributed significantly to the overall group difference.

Pictorial illustration of the interaction effect on Attendance indicated that the effects of preschool experiences varied for Follow-Through and Control 2 schools (Figure 9).

FIGURE 9

PROFILE OF INTERACTION EFFECTS OF PRESCHOOL X TREATMENT ON ATTENDANCE



Control 2	96%	94%
Follow-Through	89%	96%

- The influence of preschool experience in raising attendance was most evident in Follow-Through classes, where children with preschool experiences showed higher attendance than comparable children with no preschool experiences. In Control 2 classes, attendance appeared to be comparable, regardless of preschool experience.

Effects of Independent Variables on Achievement, Self-Concept, and Attendance at Fourth Grade

This discussion will attempt to respond to the following question: To what degree did the pre-test measures correlate with achievement, self-concept, and attendance measures? Which of the 11 covariates appeared to be the best predictor of the dependent variables?

An overall significant degree of association between the two sets of dependent and independent variables was noted: Multivariate F = 2.31, $p < .0001$. Five out of the 11 pre-test measures (CTBS Reading Comprehension, Vocabulary, Computation, and Concepts Subtests, and Stanford Diagnostic Reading) demonstrated a significant degree of correlation with the seven dependent variables, when the contribution of each covariate was analyzed independently.

A regression analysis of the seven dependent and seven independent variables indicated the following key findings:

- Approximately 17% of the variance of the dependent variables may be attributed to the effects of the 11 covariates.
- The seven covariates appeared to have the greatest influence on two out of the seven dependent variables, CTBS Reading Comprehension and Vocabulary.

Analysis of the independent contribution of the seven covariates through the stepwise regression analysis indicated the following findings:

- Six out of 11 independent variables (CTBS Applications, Metropolitan Readiness Tests Total Score, PLR, Chronological Age, Mobility, and Self-Concept Ratings showed no significant contribution to the variance of the seven dependent variables.

- Of the five covariates found to have significant regression, the CTBS Reading Comprehension and Computation subtests' scores appeared to be the best predictors ($p < .0001$). The other predictors ranked in the the order of significance were as follows:

CTBS Vocabulary	$p < .001$
Stanford Diagnostic Reading	$p < .005$
CTBS Concepts	$p < .05$

G. Factors Influencing Achievement and Self-Concept

Factors Influencing Children's Performance: This section will discuss by grade level, the effects of additional variables other than factors presented earlier (treatment, teacher, preschool experience, sex), on children's performance in achievement and self-concept measures at the end of the school year. Regression analysis technique has been utilized to estimate the relationship between the dependent variables (performance at the end of the school year) and the covariates (or independent or predictor variables).

This discussion will attempt to respond to the following questions:

- Is there any significant association between the covariates and the dependent variables?
- Which of the covariates represent the best predictor or best combination of predictors?
- Are there significant effects of duration of Follow-Through participation and attendance on the dependent variables?

Findings

The following findings are summarized from the five regression analyses (Chart II):

- Significant associations were noted between the covariates and the dependent variables at each grade level.

CHART II

SUMMARY OF STEPWISE REGRESSION RUNS ANALYZING INDIVIDUAL CONTRIBUTION OF EACH COVARIATE BY GRADE WITHIN PROJECT FOLLOW-THROUGH

Kindergarten	First Grade	Second Grade	Third Grade	Fourth Grade
Attendance Stanford Early School Pre Environment* Mathematics* Letters and Sounds Aural Comprehension Self-Concept Ratings Pre Chronological Age	Duration of Follow-Through Participation Attendance Metropolitan Readiness Tests* Self-Concept Ratings Pre* Chronological Age Mobility	Duration of Follow-Through Participation* Attendance Metropolitan Readiness Tests PLR* Stanford I Pre Tests Paragraph Meaning Word Reading* Vocabulary Arithmetic Self-Concept Ratings Pre* Chronological Age Mobility	Duration of Follow-Through Participation Attendance Metropolitan Readiness Tests PLR* Stanford II Pre Tests Paragraph Meaning Word Meaning* Language Computation* Concepts* Self-Concept Ratings Pre* Chronological Age Mobility	Duration of Follow-Through Participation Attendance Metropolitan Readiness Tests PLR* Stanford Diagnostic* Comprehensive Tests of Basic Skills Reading Vocabulary Reading Comprehension Arithmetic Computation Arithmetic Concepts Arithmetic Applicat. Self-Concept* Ratings Pre Chronological Age Mobility

* Significant influences ranging from $p < .05$ to $p < .0001$

- PLR scores (Kuhlmann-Anderson) appeared to be the best predictor of achievement.
- Initial teachers' ratings of participants at the beginning of the school year appeared to be a good predictor of achievement.
- Selected subtest pre-test measures, e.g. Word Meaning, appeared to be also one of the better predictors of achievement.
- The duration of Follow-Through participation and attendance hardly affects achievement skills.

1. Project Follow-Through at First Grade

The dependent variables consisted of children's performance on Stanford I (W) Paragraph Meaning, Vocabulary, Word Reading, and Arithmetic subtests, and teachers' ratings of self-concept at the end of first grade. The covariates consisted of duration of Follow-Through participation in days, attendance in days, Metropolitan Readiness Tests Total Score, teachers' initial ratings of self-concept, chronological age, and mobility.

The following key findings were noted:

- A significant degree of association was noted between the six covariates and five independent variables ($F=2.84$, $p<.0001$).
- The effects of the six covariates were found to be significant ($p<.02$ to $p<.0001$) on each of the five dependent variables, with predictable variances (attributed to the six covariates) ranging from 14% (Vocabulary) to 28% (Word Reading).
- Based on canonical correlational analysis, approximately 14.51% of the total variance of the five variables may be attributed to the effects of these six covariates.

When the contribution of each of the six covariates was analyzed through the stepwise regression analysis, it was noted that only two variables made significant contribution. The following findings were noted:

- The Metropolitan Readiness Tests Total Score obtained a year earlier, appeared to show the largest contribution to the variance of the dependent variables. The higher the scores were, the higher were the achievement scores and self-concept ratings one year later.
- Teachers' initial self-concept ratings of participants at the beginning of the school year also contributed significantly to the total variance. The higher the teachers' perceptions of the child's self-concept, the higher the probabilities of the child's showing higher achievement and self-concept measures, at the end of the school year.

It is notable that neither duration of Follow-Through participation nor attendance showed any effect on children's performance at the end of the first grade. The implication is that, performance at first grade is hardly influenced by these two variables.

2. Project Follow-Through at Second Grade

The dependent variables consisted of children's performance on Stanford II (X) Paragraph Meaning, Word Meaning, Language, Computation, Concepts, and teachers' ratings of pupils' self-concept at the end of second grade. The covariates consisted of duration of Follow-Through participation, attendance, PLR (Kuhlmann-Anderson Form B), Metropolitan Readiness Tests Total Score, Stanford I (X) Paragraph Meaning, Word Reading, Vocabulary, Arithmetic subtests, teachers' ratings of participants' self-concept (October 1971), and mobility.

The following key findings were noted:

- A significant degree of association was noted between the ten covariates and six dependent variables ($F = 2.49$, $p < .0001$).
- The effects of the ten covariates were found to be significant on five of the six covariates, as observed effects on Language scores fell below significance. Predictable variances ranged from 32% (Paragraph Meaning) to 50% (Self-Concept Ratings).
- Based on canonical correlational analysis, approximately 20.09% of the total variance of the six dependent variables may be attributed to the effects of the ten covariates.

When the contribution of each of the ten covariates was analyzed through the stepwise regression analysis, it was noted that only four variables made significant contribution. The following findings were noted:

- The PLR score obtained at the beginning of the school year, appeared to show the largest contribution ($p < .0001$) to the variance of the dependent variables. The higher the PLR scores were, the higher were the achievement scores and self-concept scores were, at the end of the second grade.

- Duration of Follow-Through participation showed significant ($p < .05$) contribution to the total variance of the dependent variables. The longer the child participated, the higher were the arithmetic and self-concept scores.

- Teachers' initial ratings of participants' self-concept evidenced significant contribution ($p < .001$) to the total variance of the six variables. However, only two of the six variables were significantly influenced by this covariate: The higher the initial ratings were, the higher were the Paragraph Meaning scores and later self-concept ratings.

- Word Reading scores obtained at the beginning of the school year evidenced significant contribution ($p < .05$) to the total variance.

3. Project Follow-Through at Third Grade

The dependent variables consisted of children's performance on Stanford II (W) Paragraph Meaning, Word Meaning, Language, Computation, and Concepts subtests, CTBS Vocabulary, Comprehension, Mechanics, and Expression subtests, and teachers' ratings of pupils' self-concept at the end of third grade. The covariates consisted of duration of Follow-Through participation, attendance, PLR (Kuhlmann-Anderson Form C), Metropolitan Readiness Tests Total Score, Stanford II (X) Paragraph Meaning, Word Meaning, Language, Computation and Concepts subtests, teachers' ratings of pupils' self-concept, chronological age, and mobility.

The following key findings were noted:

- A significant degree of association was noted between the 12 covariates and ten dependent variables ($F = 2.64$, $p < .0001$).

- The effects of the 12 covariates were found to be significant on all the ten dependent variables. Predictable variance ranged from 28% (Language) to 63% (Paragraph Meaning).

- Based on canonical correlational analysis, approximately 21.81% of the total variance of the ten dependent variables may be attributed to the effects of the 12 covariates.

When the contribution of each of the 12 covariates was analyzed through the stepwise regression analysis, it was noted that only six of the 12 variables made significant contribution. The following observations were noted:

- The PLR score obtained at the beginning of the school year appeared to show the largest contribution ($p < .0001$) to the variance of the dependent variables. The higher the PLR scores, the higher were the children's level of performance in achievement and self-concept.

- Teachers' initial ratings of participants showed significant influences ($p < .0001$) on children's overall performance. The higher the initial ratings, the higher were the achievement and self-concept scores.

- Word Meaning scores also demonstrated significant effects ($p < .001$) on children's overall performance. The higher the initial Word Meaning scores, the higher were the achievement and self-concept scores.

- Computation scores also demonstrated significant effects ($p < .005$) on children's overall performance. The higher the initial scores on Computation subtest, the higher were the achievement scores.

- Concept scores also evidenced significant effects ($p < .02$) on children's overall performance. The higher the initial concept scores, the higher were the achievement scores.

- Mobility also evidenced significant effects ($p < .05$) on children's overall performance. The lower the number of school transfers made, the higher were the achievement scores.

Similar findings were noted in a separate regression run which examined the effects of seven covariates on reading measures. The reading measures included post scores on Vocabulary and Comprehension (CTBS), Paragraph Meaning and Word Meaning (Stanford II), Mechanics and Expression (CTBS), and Stanford Language subtest. The covariates included Follow-Through duration, PLR, Metropolitan Readiness Tests Total Score, and Stanford II Word Meaning, Paragraph Meaning, Language, and initial teachers' ratings of self-concept.

The following observations were noted:

- A significant degree of association was noted between the seven covariates and seven dependent variables ($F = 3.71$, $p < .0001$).
- Based on canonical correlational analysis, approximately 15% of the total variance may be attributed to the effects of the seven covariates.
- Four of the seven covariates contributed significantly to the total variance, when the contribution of each covariate was analyzed independently. The four covariates included PLR, Metropolitan Readiness Tests Total Score, Word Reading, and initial teachers' ratings of participants' self-concept.

4. Project Follow-Through at Fourth Grade

The dependent variables consisted of children's performance on CTBS Reading and Math subtests, and self-concept ratings at the end of fourth grade. The covariates consisted of duration of Follow-Through participation, attendance, chronological age, mobility, children's performance on Metropolitan Readiness Tests Total Score, Stanford Diagnostic Reading (September 1971), Kuhlmann-Anderson (PLR), CTBS Reading and Math subtests (November 1971).

The following key findings were noted:

- A significant degree of association was noted between the 13 covariates and six dependent variables ($F = 1.61$, $p < .003$).

- The combined effects of the 13 covariates were found to be significant ($p < .01$ to $p < .0001$) on each of the six dependent variables, with predictable variance ranging from 40% (Self-Concept) to 60% (Vocabulary).

- Based on canonical correlational analysis, approximately 28% of the total variance of these dependent variables may be attributed to the effects of these 13 covariates.

When the contribution of each covariate was analyzed through the stepwise regression analysis, it was noted that only two variables made a significant contribution. The following findings were noted:

- The PLR score obtained at entry to third grade appeared to show the largest contribution to the variance of the dependent variables ($p < .001$). The higher the PLR scores, the higher were the achievement scores.

- Scores on the Stanford Diagnostic Reading Comprehension subtest obtained at entry to third grade also contributed significantly ($p < .001$) to the total variance. The higher the reading scores, the higher were the achievement scores.

It is notable that neither duration of Follow-Through participation or attendance showed any influence on children's basic achievement skills at the end of fourth grade. The implication is that, performance at fourth grade is hardly influenced by these two variables.

V. SUMMARY AND CONCLUSIONS

A. Summary of Key Findings

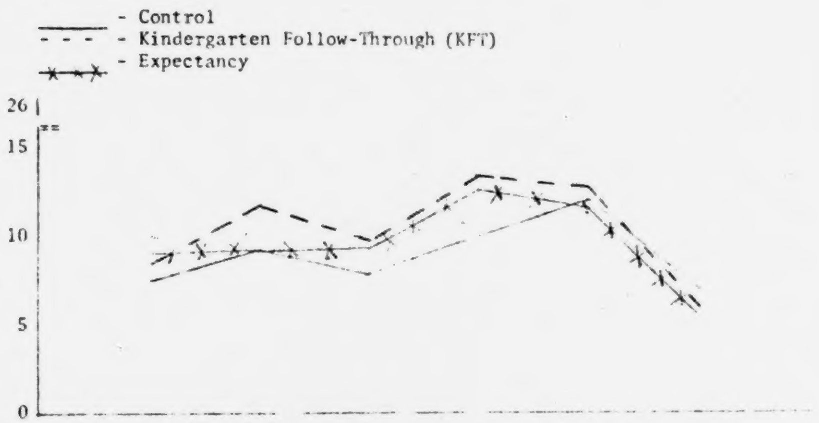
1. Overall group difference between Kindergarten Follow-Through and control children was highly significant in favor of Kindergarten Follow-Through children (Multivariate F-value = 6.40, p<.0001), based on analysis of performance on the Metropolitan Readiness Tests (MRT) and Stanford Early School Achievement Test (SESAT), self-concept ratings, and attendance measures.

   a. Kindergarten Follow-Through children demonstrated a higher level of readiness skills as compared to control children, based on performance on the Metropolitan Readiness Tests and Stanford Early School Achievement Test at the end of the school year.

      - Kindergarten Follow-Through children were functioning at the 65th percentile on the Metropolitan Readiness Tests as a mean total score of 62.04 was noted. Control children were functioning at the 51st percentile as a mean total score of 55.07 was reported. Comparison of performance of these two groups by Metropolitan Readiness Tests subtests indicated that Follow-Through children were functioning above expectancy in two out of six subtests (Listening and Alphabet), and were functioning at expectancy in the remaining subtests. Control children were functioning above expectancy in one out of six subtests (Alphabet), below expectancy in one subtest (Word Meaning), and at expectancy level in the remaining subtests (Figure 10).

FIGURE 10

OBSERVED MEAN SCORES OF KINDERGARTEN FOLLOW-THROUGH AND CONTROL CHILDREN COMPARED WITH EXPECTANCY



	Word Meaning	Listening	Matching	Alphabet	Numbers	Copying
Control	7.52	9.07	9.11	12.54	11.35	5.48
KFT	8.62	11.71	9.65	13.36	12.63	6.07
Expectancy	9.00	9.00	8.00	10.00	12.00	7.00

- Kindergarten Follow-Through and control children reported comparable level of gains on the SESAT over a nine-month period as noted below:

	October 1971	May 1972	Gains
Control	53.67	78.73	25.06
KFT	55.17	80.64	25.47

These findings indicated attainment of the following product objective: Kindergarten Follow-Through children will show higher level of reading readiness skills ($p < .05$) than an appropriate comparison group at the end of the 1971-1972 school year, as evidenced by scores obtained on Metropolitan Readiness Tests.

b. Kindergarten Follow-Through children evidenced significantly higher level of self-concept ($p < .01$), based on teachers' ratings on a five-point self-concept rating scale at the end of the school year:

	October 1971	May 1972	Change
Control	2.84	2.99	0.15
KFT	2.92	3.76	0.84

This finding indicated attainment of the following product objective: Kindergarten Follow-Through children will show more positive self-concept than an appropriate comparison group at the end of the 1971-1972 school year, as based on scores obtained on a test of self-concept, on teachers' ratings, and parents' reports.

c. Control children evidenced significantly higher attendance ($p < .01$) than did Kindergarten Follow-Through children during the 1971-1972 school year: Control children evidenced mean attendance of 167.00 days, while Kindergarten Follow-Through children reported a mean attendance of 159.20 days.

This finding indicated attainment of the following product objective: Kindergarten Follow-Through children will show higher attendance ($p < .05$) than an appropriate comparison group during the 1971-1972 school year.

d. Comparison of ratings of two kindergarten teachers indicated minor differences in favor of the teacher with more Project-teaching experience based on a seven-point rating scale completed by Project administrative staff:

   - Teacher B, with three years of Project-teaching experience, showed a mean rating score of 5.88, as compared to a mean rating of 5.44 for Teacher A, with two years of Project-teaching experience.

   - Both teachers received identical ratings on seven out of nine behavioral categories. They differed in two categories where Teacher B showed higher ratings in "degree of implementation of classroom discovery learning" and in "degree of implementation of child-centered learning experiences."

   These findings indicated attainment of the following product objective: Kindergarten Follow-Through teachers will evidence higher ratings on the Responsive Classroom Rating Scale at the end of the year compared to observed ratings at the beginning of the year.

2. Overall group difference between First Grade Follow-Through and Control 1 children was highly significant in favor of Follow-Through children (Multivariate F = 9.52, $p < .0001$). Similarly, overall group difference between First Grade Follow-Through and Control 2 children was highly significant in favor of Follow-Through children (Multivariate F = 6.08, $p < .0001$). Analysis was based on performance on Stanford I Paragraph Meaning, Vocabulary, Word Reading, and Arithmetic subtests; Self-Concept, and Attendance measures.

   a. First Grade Follow-Through children evidenced significantly higher level of basic readiness and math skills ($p < .01$) when compared to either Control 1 or Control 2 children (Table 33).

TABLE 33

OBSERVED MEAN RAW SCORES BY STANFORD I SUBTEST BY TREATMENT GROUP

Stanford I Subtest	Control 1	Follow-Through	Control 2
Paragraph Meaning	13.73	18.24	15.35
Vocabulary	18.33	15.62	14.28
Word Reading	18.95	19.98	17.67
Arithmetic	27.59	34.25	23.52

This finding indicated general attainment of the following product objective: First Grade Follow-Through children will show higher level of basic achievement skills in reading and arithmetic ($p < .05$) than an appropriate comparison group at the end of the 1971-1972 school year, based on scores obtained on standardized test measures.

b. Control 2 children evidenced significantly higher level of self-concept ratings than did Follow-Through children, based on a five-point teacher-completed self-concept ratings scale at the end of the school year:

	Mean Rating
Control 1	3.19
Control 2	3.65
Follow-Through	3.29

This finding indicated that the following product objective was not attained: First Grade Follow-Through children will show more positive self-concept than an appropriate comparison group at the end of the 1971-1972 school year, based on scores obtained on a test of self-concept, on teachers' ratings, and parents' reports.

c. Differences in attendance between Control 1 and Follow-Through children, as well as between Control 2 and Follow-Through children did not meet significance.

This finding indicated that the following product objective was not attained: First Grade Follow-Through children will show higher attendance ($p < .05$) than an appropriate comparison group during the 1971-1972 school year.

d. Comparisons of mean ratings of four First Grade Follow-Through teachers indicated no relationships between Project-teaching experience and ratings received. Mean ratings were based on a locally devised seven-point rating scale completed by Project administrative staff, at the end of the school year. Mean ratings for the four First Grade Follow-Through teachers are indicated below:

Teacher	Number of Years of Project Experience[1]	Mean Rating
C	2	5.33
D	3	4.44
E	1	3.11
F	1	5.11

This finding indicated the following product objective was not attained: First Grade Follow-Through teachers will receive ratings on the Responsive Classroom Rating Scale which will be directly proportional to the number of years of experience in the Project.

e. Duration of Project participation showed no impact on basic reading and math skills, and concept ratings at first grade. Mean duration of Project participation was estimated at 281 days (s.d. = 92.91 days) with duration ranging from 40 days to 360.00 days.

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[1] Four years as the maximum number of years of Project experience as First Grade Follow-Through Project was initiated during the 1968-1969 school year.

This finding indicated that the following product objectives were not met: Duration of Follow-Through participation from kindergarten through first grade will show significant positive effects on basic reading and math skills, and self-concept ratings at the end of the school year.

3. Overall group difference between Second Grade Follow-Through and control children was highly significant in favor of control children, based on analysis of performance on Stanford Primary II Paragraph Meaning, Word Meaning, Language, Computation, and Concepts; Self-Concept Ratings; and Attendance measures.

   a. Control children evidenced significantly higher level of reading skills than did Follow-Through children based on performance on the Stanford Primary II subtests (Table 34). However, differences in basic math skills between the two groups did not meet significance.

TABLE 34

MEAN SCORES ON STANFORD PRIMARY II
BY SUBTEST BY TREATMENT GROUP

Stanford II Subtest	Control	Follow-Through
Paragraph Meaning	22.28	16.11
Word Meaning	14.14	11.16
Language	28.29	25.84
Computation	19.05	15.93
Concepts	14.97	13.41

This finding indicated that the following product objective was not attained: Second Grade Follow-Through children will show higher level of basic achievement skills in reading and arithmetic ($p < .05$) than an appropriate comparison group at the end of the 1971-1972 school year, based on scores obtained on standardized test measures.

b. Differences between Second Grade Follow-Through and control children in self-concept ratings were not significant, based on a five-point teacher completed self-concept rating scale, at the end of the school year. Observed mean ratings follow below:

	October 1971	May 1972	Gain
Control	2.87	3.46	0.59
Follow-Through	3.02	3.25	0.23

This finding indicated that the following product objective was not attained: Second Grade Follow-Through children will show more positive self-concept than an appropriate comparison group at the end of the 1971-1972 school year, as based on scores obtained on a test of self-concept, on teachers' ratings, and parents' reports.

c. Control children evidenced significantly higher attendance than did Second Grade Follow-Through children during the 1971-1972 school year. Mean attendance was noted as follows:

Control	170.6 days
Follow-Through	163.7 days

This finding indicated that the following product objective was not attained: Second Grade Follow-Through children will show higher attendance ($p<.05$) than an appropriate comparison group during the 1971-1972 school year.

d. Comparisons of mean ratings of four Second Grade Follow-Through teachers indicated no relationships between Project-teaching experiences and ratings received. Mean ratings were based on a seven-point rating scale completed by Project administrative staff, at the end of the school year. Mean ratings and years of Project-teaching experience for the four Follow-Through teachers are indicated as follows:

Teacher	Number of Years of Project Experience[1]	Mean Rating
G	1	2.77
H	2	5.55
I	1	4.77
J	3	4.55

This finding indicated that the following product objective was not attained: Second Grade Follow-Through will receive ratings on the Responsive Classroom Rating Scale which will be directly proportional to the number of years of experience in Second Grade Follow-Through Project.

e. Duration of Project participation showed significant effects ($p < .05$) on six dependent variables (Stanford II subtests and self-concept scores) at the end of the second grade. Analysis of its influence for each variable indicated its significant effect was limited only to arithmetic computations and self-concept measures: The longer the duration of Project participation, the higher were the computations and self-concept scores. Average duration of Project participation was estimated at 426.09 days (s.d. = 138.74 days), with duration ranging from 84 to 540 days.

This finding indicated only partial attainment of the following product objective: Duration of Follow-Through participation at second grade will show significant positive effects on basic reading and mathematics skills at the end of the school year. However, the following objective was completely attained: Duration of Follow-Through participation at second grade will show significant positive effects on self-concept at the end of the school year.

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[1] Three years as maximum number of years of Project experience as Second Grade Follow-Through Project was initiated during the 1969-1970 school year.

4. Overall group difference between Third Grade Follow-Through and control children was highly significant (Multivariate $F = 3.45$, $p < .01$), based on analysis of performance on Stanford Primary II Paragraph Meaning, Word Meaning, Language, Computation, and Concepts; Self-Concept ratings; and Attendance measures.

   a. Control children evidenced significantly higher level of reading and math skills than did Follow-Through children at the end of the school year.

TABLE 35

OBSERVED MEAN SCORES ON STANFORD PRIMARY II
BY SUBTEST BY TREATMENT GROUP

Stanford II Subtest	Control			Follow-Through		
	October 1971	May 1972	Gains	October 1971	May 1972	Gains
Paragraph Meaning	19.64	31.09	11.45	15.21	23.61	8.40
Word Meaning	13.37	17.31	3.94	9.48	15.97	6.49
Language	27.62	33.50	5.88	27.77	31.86	4.09
Computation	17.64	30.86	13.22	12.75	25.24	12.49
Concepts	14.97	19.87	4.90	13.04	18.02	4.98

This finding indicated that the following product objective was not attained: Third Grade Follow-Through children will show higher level of basic achievement skills in reading and arithmetic ($p < .05$) than an appropriate comparison group at the end of the 1971-1972 school year, based on scores obtained on standardized test measures.

   b. Differences between Third Grade Follow-Through and control children in self-concept ratings were not significant, based on a five-point teacher-completed self-concept scale at the end of the school year. Observed mean ratings follow below:

	October 1971	May 1972	Gain
Control	2.97	3.07	.10
Follow-Through	3.36	3.09	-.27

This finding indicated that the following product objective was not attained: Third Grade Follow-Through children will show more positive self-concept than an appropriate comparison group at the end of the 1971-1972 school year, as based on scores onbtained on a test of self-concept, on teachers' ratings, and parents' reports.

c. Difference between Third Grade Follow-Through and control children in attendance was not significant during the 1971-1972 school year. Observed mean attendance was as follows:

Control	165.9 days
Follow-Through	165.7 days

This finding indicated that the following product objective was not attained: Third Grade Follow-Through children will show higher attendance ($p < .05$) than an appropriate comparison group during the 1971-1972 school year.

d. Comparisons of mean ratings of four Third Grade Follow-Through teachers indicated no consistent pattern in ratings received and years of Project-teaching experience, based on a seven-point rating scale completed by Project administrative staff at the end of the school year. Mean ratings and years of Project experience are indicated below:

Teacher	Number of Years of Project Experience[1]	Mean Rating
K	2	5.11
L	1	5.00
M	2	5.55
N	1	5.33

---

[1] Two years as maximum number of years of Project experience as Third Grade Follow-Through Project was initiated during the 1970-1971 school year.

This finding appeared to be a function of the limited range of number of years of Project teaching experience, with two years as the maximum and one year as the minimum. Thus, attainment of the following product objective cound not be ascertained: Third Grade Follow-Through teachers will receive ratings on the Responsive Classroom Rating Scale which will be directly proportional to the number of years of experience in the Project.

e. Duration of Project participation showed no significant effects on basic reading and math skills and self-concept ratings at first grade. Mean duration of Project participation was estimated at 475 days (s.d. = 224 days), with duration ranging from 40 days to 720 days.

This finding indicated that the following product objective was not attained: Duration of Follow-Through participation at first grade from kindergarten through third grade will show significant positive effects on basic reading-math skills and on self-concept ratings at the end of the school year.

5. Exploratory studies of former Follow-Through pupils 'in transition' attending regular fourth grade classes at Mary B. Martin School, compared with fourth-grade pupils with no similar experiences from two non-Follow-Through schools indicated the following findings:

   a. Differences in basic achievement skills, self-concept ratings and attendance were not significant when 'in transition' children were compared with regular fourth grade children from a non-Follow-Through school (Control 1) comparable to the Follow-Through school in poverty and in mobility indices.

b. Overall group difference was significant (Multivariate F = 2.23, $p < .05$) when comparisons were made between the children 'in transition' and Control 2 or regular fourth grade children. Control 2 children were attending non-Follow-Through schools which were better socio-economically than the Follow-Through school, based on lower poverty and lower mobility indices. Performance on CTBS Arithmetic Concepts represented the most significant difference between the two groups and contributed to the overall group difference:

- Children 'in transition' were functioning at 3.3 grade level as compared to Control 2 children who were functioning at 4.3 grade level at the end of fourth grade.
- Children 'in transition' were functioning at 2.5 grade level as compared to Control 2 children who were functioning at 3.2 grade level in the early part of third grade (November 1970).

Findings from these exploratory studies represented trends similar to earlier studies of the same three groups at kindergarten through third grade. The absence of mere differences between these children 'in transition,' and the two other control groups suggests that despite the initial chaos of Follow-Through in its initial years of implementation, these former Follow-Through children who constituted the very first group of Follow-Through graduates, did manage to learn.

6. Differences attributed to teacher factor appeared to transcend differences attributed to treatment (school) effects. Analysis of teacher comparisons within each treatment (school) revealed 15 out of 19 teacher comparisons were highly significant ($p < .05$ to $p < .0001$).

   a. At kindergarten, teacher comparisons within Follow-Through and control school were significant.

   b. At first grade, teacher comparisons at Follow-Through and the two control schools were highly significant.

   c. At second grade, two out of three teacher comparisons in Follow-Through school, and two teacher comparisons in control school were highly significant.

d. At third grade, three teacher comparisons were non-significant while the two teacher comparisons within control school were highly significant.

7. A follow-up of Follow-Through and control pupils at two grade levels indicated significant differences in favor of second grade controls at the end of the 1970-1971 and 1971-1972 school years. However, differences did not meet significance in the follow-up of Third Grade Follow-Through and control pupils (Table 36).

TABLE 36

SUMMARY OF FOLLOW-UP STUDIES OVER A TWO-YEAR PERIOD, 1970-1971, AND 1971-1972 SCHOOL YEAR

Follow-Up Studies By Year	Dependent Variable	Group Holding Advantage
Second Grade Follow-Through Vs. Controls		
1970-1971	Stanford I Reading Stanford I Math	Control No Difference
1971-1972	Stanford II Reading Stanford II Math	Control No Difference
Third Grade Follow-Through Vs. Controls		
1970-1971	Stanford II Reading Stanford II Math	No Difference No Difference
1971-1972	Stanford II Reading Stanford II Math	No Difference No Difference

a. Second Grade Follow-Through Vs. Controls

- At the end of first grade (May 1971), control children evidenced significantly higher level of performance ($p < .01$) than did the Follow-Through children, on two (Paragraph Meaning and Word Reading) out of three Stanford 1 Reading subtests. A year later (May 1972), the same control group evidenced significantly higher level of performance ($p < .01$) than did the Follow-Through group on the Stanford Paragraph Meaning subtest only. Thus, differences between these two groups noted at the end of second grade, did not appear to be as great as differences noted a year earlier.

b. Third Grade Follow-Through Vs. Controls

- Overall group differencesbetween these two groups were not significant at the end of the second and third grades.

These findings suggest that the consistent superior performance of controls over the Follow-Through children observed in the past (refer to previous evaluation reports) was not maintained over time. These findings may be a function of introducing 'structure' into what has been a relatively fluid and unstructured program change in Project administration, differences in program emphasis, etc.

7. The influence of preschool experience on basic achievement skills, attendance and self-concept ratings, failed to reflect a consistent trend. This finding may be a function of several factors including:

   a. Preschool experience is not unitary as it interacts with a variety of school and non-school experiences. The more remote the experience is, the more difficult it becomes to attribute anything to such experience as they become compounded by other variables.

   b. Learning is not a function only of the interaction between children and teacher, it is a process that is going on between children themselves, as well as between children and the outside world.

9. Analysis of variables influencing achievement and self-concept of Follow-Through children at the end of the school year, kindergarten through fourth grade, indicated that teachers' initial self-concept ratings of participants, represented the best predictor of performance. Self-concept ratings showed a positive and direct relationship on performance: The higher the initial ratings, the higher was the performance level. Other key findings were noted:

   a. Duration of Follow-Through participation evidenced no influence on achievement or self-concept except at second grade.

   b. Attendance and chronological age hardly showed any impact on performance.

   c. PLR scores (Kuhlmann-Anderson) appeared to be the best predictor of achievement and self-concept when available.

   d. Selected pre-test measures were also found to be good predictors of children's performance.

Findings from item number 9 suggest that the time of the data collection may determine the degree of impact of such data on performance. The more recent the test data, the higher are the probabilities of its significant impact; the more remote the test data, the less are the probabilities of demonstrating a significant influence. The recency of initial self-concept ratings, pre-test measures, and PLR scores may account for its consistent significant effects on performance. Similarly, the effects of Metropolitan Readiness Tests total scores (obtained at kindergarten) were only found to be significantly predictive of performance at first grade. Its influence became less evident, however, at the upper primary levels.

10. Ratings of Follow-Through teachers by the Project administrative staff on a seven-point Responsive Classroom Observation Rating Scale indicated implementation of the Responsive Principle with the more 'responsive' classroom behaviors at kindergarten with the less responsive classroom behaviors at first grade. The following key findings were noted:

   - Utilization of the Language Experiences in Reading approach decreases as one goes up the grade level.
   - Degree of teacher's verbal demeaning behavior appeared to be strongly correlated with application of strong physical force to insure classroom control.

11. Relationships between mean ratings received and class achievement from kindergarten to third grade, were not evident.

These findings suggest that other critical variables affect classroom achievement other than the degree of implementation of 'Responsive' classroom environment principle, or the duration of Project-teaching experience. These findings further suggest the need to re-examine those variables presently unknown which are affecting classroom performance.

B. Implications and Recommendations

Project Effectiveness and Achievement: Project Follow-Through appeared to be most effective at kindergarten and first grade, and least effective at the upper grade levels. At the two lower grade levels, Follow-Through children evidenced a higher level of basic readiness and achievement skills than did the control children. At the upper grade levels (grades 2 through 4), control children tended to show significantly higher level of performance than did Follow-Through children.

The superior performance of Kindergarten and First Grade Follow-Through children over the control groups alluded to, represents increasing effectiveness of this program over four to four and a half years of Project operation. In the past (during the school years January-June 1968, 1968-1969, and 1969-1970), control children had always demonstrated significantly higher level of performance than did Kindergarten Follow-Through children until the 1970-1971 school year, when the trend was reversed. Kindergarten Follow-Through children then evidenced significantly higher level of readiness skills than did the control groups for the first time in three and a half years. The trend was continued to the current school year. The significantly higher level of performance of First Grade Follow-Through children over the control group during the 1971-1972 school year occurred for the first time in four years of implementation of First Grade Follow-Through Project. The implication from these findings appears to be that continuing implementation will result in increasing Project effectiveness to affect achievement and readiness skills, with increasing understanding of the theory underlying the 'Responsive' classroom environment with increasing experience in its implementation. It should be noted, however, that the Responsive Environment Principle as presently implemented, has undergone several modifications introduced at the local level. Some structure has been added to what has been considered 'too open' or 'too unstructured' approach of the Responsive Principle in an effort to make it more relevant to the local needs. It is highly probable, therefore, that the increasing effectiveness of this Project may be a function of the local impact to the Responsive classroom environment, rather than the sole influence of the responsive approach.

Trends reflecting lower performance of Follow-Through children when compared to control children at second and third grades appeared to be continuing. Product objectives relative to achievement, self-concept, and attendance were hardly attained this year as in the previous years. These trends may be a function of children's earlier exposure to a program in its early developmental phase. The Responsive program then, two years ago, was operating in a random trial-error fashion, with its share of problems which are usually associated with pilot programs in its initial year of operation. Or, the poor observed performance may be a function of children's earlier exposure to a totally 'unstructured' or 'too open' approaches, primarily diverted at developing their self-concept.

Follow-Up Studies and Achievement: The superior performance of control children over Follow-Through children at grades 2 and 3 during the 1971-1972 school year (see pages 12-13) was not always verified by the follow-up studies. A two-year follow-up of controls and Second Grade Follow-Through children indicated that although the controls showed significantly higher level of achievement at the end of the second year, differences were not as great as those observed a year earlier. A two-year follow-up of Third Grade Follow-Through and control children indicated that differences at the end of second grade and at the end of third grade were non-significant. Group differences which consistently favored the controls in the past appeared to have disappeared over time.

Findings from these follow-up studies may be a function of many factors occurring during the 1971-1972 school year. The most obvious was the change in administration of Project Follow-Through. This change at the top heralded other equally important changes most evident in program structure, program emphasis, and in staff receptivity to ideas. A structure was introduced into what has been generally fluid, open, and very unstructured program, although the general intent of the responsive program structure was maintained. Awareness of building up the child's self-concept continued to be the focus of the program, but not at the expense of ignoring such basic skills as reading at grades 1 to 3. The child's curiosity, his capacity to learn, and interest were utilized as a media on which to provide individualized classroom instruction, but teachers assumed a more active role in guiding learing activities for acquisition of basic skills. The Model's basic reading approach, Language Experiences in Reading, for example, was supplemented with other reading approaches at the discretion of the teacher involved. Teaching staff's reactions to the change in administrative set-up was very positive. A rapport established between Project administration and teaching staff, no doubt resulted in greater cooperation and more willingness to try out new ideas than would have been possible, under different circumstances.

Another factor worth considering is the mobility pattern. Over a two-year period, children from Follow-Through and control schools were hardly stable. For example, in the follow-up of Third Grade Follow-Through and control children, less than half of Follow-Through group remained, as compared to 59% of control group who stayed. Were those who were moving out of the district the higher achieving, the more motivated youngsters?

Project Effectiveness and Self-Concept: One of the unusual findings in this report is that Follow-Through children failed to demonstrate consistently significantly higher level of self-concept ratings than did the controls. Only Kindergarten Follow-Through children demonstrated significantly higher self-concept ratings, as compared to comparable control group. When one considers that the Responsive Environment Principle is built around the enhancement of the child's self-concept, it is remarkable that its manifestation was not at all evident. However, this finding may be a function of the test instrument utilized. Teachers' ratings may not truly reflect a valid measurement of the child's self-concept. Furthermore, one wonders also what is self-concept? Are there better, more valid techniques of assessing change in self-concept?

Factors Affecting Achievement and Self-Concept: Speculation on the adverse effects of mobility were not confirmed, as duration of Follow-Through participation was found to have no impact on performance. Attendance, and chronological age were found to have no impact also. The consistent positive effects of teachers' initial self-concept ratings of participants appeared to be somewhat related to the self-fulfilling prophesy, alluded to by Clark in 1965, and by Rosenthal and Jackson in 1968. It should be noted, however, that other variables including PLR scores and selected pre-test measures which were found to be good predictors of performance, were administered at almost the same time as the teachers' self-concept ratings. That time of data collection may in part determine the significance of their influence on performance is strongly suspected. As noted earlier, it appears that the more recent the test data, the higher the probabilities of a significant impact, and vice versa.

Teaching Influence and Performance: Trends were not consistent when mean ratings on the Responsive Classroom Rating Scale were correlated with class performance across four grade levels. Spearman relationship ranged from -1 at kindergarten to 0 at first grade.

When class achievement was correlated with duration of Project experience, correlations were consistently low from first to third grade. The high correlations noted at kindergarten may again be a function of the limited number of kindergarten teachers involved.

Completion of ratings by the Project administrative staff may reflect some biases that would affect the validity of the instrument, and therefore, may not provide a true picture of the real classroom teacher's behavior. The validity of the rating instrument itself, may also be of some question. To summarize briefly, the low correlations between classroom achievement and degree of implementation of responsive principle, as well as between classroom achievement and duration of Project-teaching experience, suggest the existence of other variables which have more impact on class performance.

Recommendations: Based on findings presented earlier, and in interviews with Project staff, the following recommendations are suggested:

1. Project Follow-Through may be contined on a limited basis.
2. Project evaluation should include an assessment of other critical variables affecting children's performance.

APPENDICES

APPENDIX A

APPENDIX A-1

Our tentative list of problem solving processes follows:

ONE-PERSON PROBLEMS

1. Recognizes, completes, extends and discovers patterns in one direction.

   Examples: The child sees colored squares of the same size in a sequence of red, blue, yellow, red, blue, ______ and recognizes that a yellow square comes next. Or, the child sees △ △ ▭ ○ △ ▭ ○ - and recognizes that a △ goes in the blank space.

2. Recognizes, completes, extends and discovers patterns in two directions (matrices or multiplicative classification).

   Examples: The child says or recognizes that OOO goes in the empty cell in the matrix.

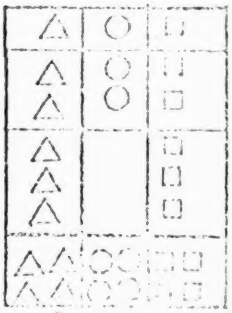


Figure 1. Sample Matrix Problem With Intersecting Classifications

3. Recognizes, extends, and discovers rules from examples (inductive reasoning).

   Examples: (The above 1, 2 are examples; and Piaget's concepts of conservation, classification and seriation are excellent content for such games)

Generates example in a rule-machine game. For example, if rule is plurals, predicts machine will say dogs if dog is the input. If machine is a "red-machine," changing not-red inputs into red ones, child will predict what the machine will do.

4. Reasons deductively: Produces own versions of games in 1, 2, and 3. Given rule for a pattern, predicts which item will come next or extends pattern. Given rules (attribute cells) for a matrix, completes the cells of the matrix.

5. Adapts to games involving rule changes (related to changing set).

Examples: Improvises appropriately while role-playing by himself (plays a tree or policeman, for example).

Adapts to new phases in Learning Booth. Adapts to new ways of playing matrix games; for example, from vertical and horizontal intersecting patterns to L-to-R and Top-to-bottom patterns (compare Figures 1 and 2).

1	3	5
7	9	
13	15	17

Figure 2. Sample Matrix
problem with left-to-right
and top-to-bottom pattern
(11 goes in the empty cell)

6. Eliminates what is known to determine what is unknown.

Examples: Given two or more stimuli that he knows and one he doesn't know, child can identify the unknown; for example, shown a picture of dog, cat, and aardvark, a child points to the aardvark when asked to.

7. Uses feedback productively; uses information; willing to guess; hypothesizes.

Examples: Modifies guess about what comes next in a pattern. If a child's guesses become more relevant to the attributes of the pattern, there is evidence of using feedback. If his first guess is relevant to the single item shown, he is willing to guess and use information. For example, if this is pattern: a bb ccc d and child has just guessed that four "d's" would be next (a relevent hypothesis), he will now modify his next guess to two "e's." This would be using feedback productively.

If, after seeing only the "a" the child guesses "b" is next, he is demonstrating a willingness to guess and the ability to use information. In both examples, you may infer that the child is hypothesizing or forming reasons for his behavior.

8. Takes different points of view.

Examples: Takes role of teacher after taking part in activity. Rotates stimulus card in embedded figures task (or rotates himself around card); literally takes a different perspective with regard to the stimulus; also indicated by flexibility and variety of responses to a stimulus (Rorschach or TAT) or stimulus situation (Dog and Bone Test).

9. Solves verbal and mathematical problems that are "less than obvious."

Examples: Writes or dictates a story based on a numerical headline. Verbalizes rules, patterns, concepts in inductive games.

10. Recognizes that a problem can not be solved.

Examples: Given an impossible task (telling color by touch), the child will either give up on the task (refuse an invitation to continue playing, walk away, say he wants to play a different game or doesn't want to play) or say, "You can't tell color with your fingers."

11. Transforms input in one sense into output in another sense: codes and maps.

Examples: Shown a shape, the child can then reach into a bag and discriminate by touch that shape from others.

Blindfolded and handed a shape to feel, the child can then point out by eye the felt shape in an array of shapes shown to him.

Shown a card with two dots and a dash (.. __), the child can discriminate by ear the associated sound (di-di-dah) and/or produce the associated sound. Given an auditory stimulus (di-di-dah), the child can discriminate it by eye and/or can write it out.

The latter two tasks are also clear operational examples of the characteristic of coding. The Map and Message games we have set aside because of production problems (silk-screening the floor mat in color), are examples of both Coding and Mapping. Some form of them should be revived. And Verna Carlsen's suggestions for matrix games contain specific examples of mapping.

12. Understands reversibility.

Examples: All inductive games foster Hypothesizing. By turning them around they can also show Reversibility, shown by a rule-machine game in which the rule is any not-red cube is changed into a red cube. This is extremely easy, grasped by nearly all kindergarteners after no more than four examples (adults usually require more examples). However, the reverse operation - red becomes not-red - is extremely difficult for kindergarteners as Piaget has clearly shown (fortunately, adults do better).

13. Recognizes and produces embedded figures.

Examples: Recognizes letters and other figures in scribble drawings.

Recognizes figures confused by intersecting lines, shared boundaries or camouflage.

Recognizes figures presented in unfamiliar or unexpected orientation or context; e.g. cow upside down in a tree or cow saddled and being ridden by a cowboy.

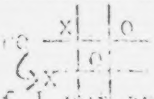
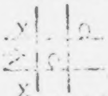
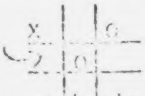
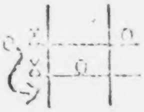
Recognizes figures (words) hidden inside other figures (or inside word, for example).

Names figures perceived in an abstract picture.

Given figures, hides them in one or more ways mentioned.

INTERACTIONAL PROBLEMS

1. Conceptualizes probable responses to alternative actions.

   Examples: If I put an X here  , opponent will probably put an O here  . If I put an X here  opponent will probably put an O here  and win.

2. Anticipates probable response.

   Examples: Similar to above except no need to adapt to rule change caused by opponent since he moves according to your rule or expectation (no need to break set).

3. Adapts to games involving rule changes.

   Examples: Responds appropriately to opponent's unanticipated move in pegity, checkers, chess or other game or activity.

   Improvises appropriately while role-playing with one or more others.

4. Takes different points of view.

Examples: If he puts his right hand in hot water, his left hand in ice water, and then puts both his hands in lukewarm water and feels the relative difference - right hand feels cool, left hand feels hot, the child will then be asked to imagine his right hand belonged to someone else who said "This water is cool," what do you say? The child indicates that "Where you've been influences what you see."

Takes different roles in dramatic play; responds appropriately to stimulus "Act as if you were (policeman, parent, classmate, etc)."

AFFECTIVE PROBLEMS

1. Copes with others' emotions.

   Examples: Expresses pleasure at others' joy.

   Sensitive to others' feelings; does not demean.

   When aware of cheating or gloating, applies this scale: ignore, points out matter of factly, expresses anger or dissappointment acceptably. Does not persist in ignoring (ostrich strategy); does not "tattle."

2. Copes with own emotions.

   Examples: Expresses joy, delight; acknowledges own rule-breaking when it is pointed out and continues playing.

   Accepts compliments. Handles anger appropriately.

THE MORE GENERAL CHARACTERISTICS OF A GOOD PROBLEM-SOLVER ARE THESE. HE IS:

1. Able to concentrate: not easily distracted, perserveres.
2. Able to learn incidentally, take a dual focus (conversing while solving a puzzle is an example).

3. Independent, autonomous, self-directing, prefers to "do it himself," but not stubborn.
4. Able to ask questions requiring extended answers ("How," "Why," "What would happen if" questions).
5. Confident, not easily persuaded to change a right answer.
6. Inventive, fluent, makes many and varied associations.
7. Imaginative; associations one or more standard deviations from the mean.
8. Reflective, focused; not impulsive.
9. Able to tolerate delay; waits turn.
10. Flexible, open, holds judgments in suspension pending further information.
11. Able to work within limitations.
12. Able to use a variety of resources to solve problems - adults, peers, materials, equipment.
13. Willing to risk failure; willing to guess, seeks challenge; withstands stress.
14. Senses dissonance or notes discrepancies (problem-sensing).
15. Deals with abstractions (concepts, symbols).
16. Plans and carries out projects.
17. Makes and honors commitments and contracts.
18. Trusting rather than suspicious.
19. Focuses on reasons for behavior rather than behavior itself.

We can provide examples of how we would help children learn the first set of problem-solving processes. A more difficult problem is helping children develop the general characteristics of a good problem-solver. Nevertheless, they are probably related to the ability to solve problems.

One of the objectives of this classroom process would be first to help the child learn the problem-solving processes that have been specified. Then each of these would be used to help a child learn new skills or acquire new information. The explicit objectives are that each of the problem-solving processes is used in teaching other concepts. An example of this classroom process objective is:

1. The teacher determines if a child can recognize numbers, four shapes △ □ ▭ ○ and four colors (red, blue, yellow, green).
2. She uses number shape, and color to help the child learn the concept of a matrix using an inductive method. That is, she does not give the rule and demonstrate but guides the child to discover the rule. Figure 1 shows such a matrix.
3. She tests the child's ability to use the matrix and helps him to generalize the concept by using shape and color in other matrices.
4. She uses the knowledge the child has of the matrix to teach new concepts in mathematics (Figure 3) and language (Figure 4).

10	12	14
8	10	12
6	8	10

Figure 3. Mathematics Matrix

tune	dune
try	dry

Figure 4. Language Matrix

A second classroom process objective would be the teacher's use of methods that are consistent with the desired styles, strategies and characteristics of effective problem-solvers. One example would be using inductive methods of teaching. The approach to teaching the concept of the matrix would be one example. Another example would be instead of asking, "What is the answer to 2 X 2?" the teacher would say, "The answer is four, what is the question?" Or the teacher would change wrong answers into right ones. For example,

Teacher: "What's 2 + 2?"

Child: "5."

Teacher: "That's the answer to 2 + 3. What's 2 + 2?"

The objective would be for the teacher to emphasize a divergent and inductive approach at least as often as she does a convergent and deductive approach.

APPENDIX A-2

READING LESSON PLAN

AIMS

To develop comprehension skills. To introduce new words. To integrate reading, writing, art, and mathematics.

MATERIALS

Chalkboard, flash cards, picture cards, textbook, paper, paints, paper basket, pocket chart, and pencils.

MOTIVATION

Game - "Pick the Apples." Pupils pick apples from tree. Each apple has a review word on it. Pupil has to tell something about each word he picks. Example, flakes - It begins with the fl blend. Each pupil counts apples he has picked. Pupil with most apples is the winner.

PROCEDURE

A. Review known words by playing game "Pick the Apples."

B. Present new words: winter, cold, middle, noises, flakes, snow, waked, sled, robe, and slippers.

C. Guide silent reading: probable questions:

1. Do you remember who Windy Chase is?
2. How did he first know that it was cold?
3. Can you describe a snowy night?
4. What did Windy think he'd do tomorrow?
5. Where was his sled?

D. Coordinate oral reading with silent reading.

E. Evaluation.

1. Discussion.

2. Pupils will write ten sentences using new vocabulary words.

ENRICHMENT

1. Pupils can paint a snow scene on colored paper or draw a snow story with white chalk.

2. Pupils can make a snow scene mural on brown paper.

3. Pupils may write a story about a winter night.

APPENDIX A-3

SCIENCE LESSON PLAN

ACTIVITY

Science (About 40-45 minutes).

TYPE OF LESSON

"Experimenting with Common Objects."

OBJECTIVES

1. To isolate and manipulate groups of objects.
2. To focus attention on objects chosen for an experiment and on the changes that occur during the experiment.

MATERIALS

For each pair of children a tray containing:

- Capped vial with water.
- Colored candy spheres.
- Scissors.
- Paper clips.
- Rubber band.
- 3" x 5" card.
- Battery.
- Flashlight.
- Bulb.
- Aluminum wire.
- Sharpened pencil with eraser.

PROCEDURE

1. Objects are placed on trays. Trays are placed on desks arranged like table in front of children.
2. Children are asked to name objects on the tray. They are told that the objects in front of them are to be manipulated in anyway they wish to see if anything happens or if any changes take place. Emphasize that there is nothing they can do wrong, anything that they choose to do is alright. Encourage them to think independently. At this time offer no suggestions. Circulate around the class room and admire what they do.

3. When referring to experiments, encourage children to name objects used and tell as nearly as possible the changes which took place.

4. Toward the end of the lesson, if all possible combinations or experiments with objects have not been tried, make specific suggestions.

5. After about 30 minutes, have the children place all objects on tray in front of them. Collect trays. There will be no organized discussion with the class at this time.

6. During the remaining time, pass out 8" x 12" sheets of newsprint. Have children fold newsprint in half, and then fold in half again. They will have eight boxes, using front and back side of newsprint, to record their experiments. Pairs of children who worked together may also work together by each recording a different experiment. They may record experiments by drawing objects used and then show, also by drawing, the changes which took place. Have pupils name all objects they used and write the names on the chalkboard. Children may refer to these names when they name objects on their papers.

7. Add these names to the vocabulary words in the Science Center. Place at least two trays of the same objects used on the table in the Science Center. Children may later use these if they wish to repeat experiments at other times during the week.

EVALUATION

1. To what extent were the objectives realized?

2. Was there pupil interest? Did it grow?

3. Was there sufficient pupil participation?

4. Did pupils work independently and did I give them time to work independently?

5. Was my verbalization at a minimum?

6. Were my questions broad and open-ended?

7. Was the lesson situation an enjoyable one for all the children?

APPENDIX A-[illegible]

SOCIAL STUDIES LESSON PLAN

OBJECTIVES

1. Learn about the houses of Eastern Woodland Indians.

2. Help children appreciate how these Indians used what was available to them to build their houses.

3. Help children understand how nature and the geography of an area influences how people live.

MATERIALS

Filmstrip - Eastern Woodland Indians - Shelter
Directions printed on tagboard for making Wigwams
Black construction paper
Brown wrapping paper
Glue, scissors, rulers, black crayons
Other materials as required by children

PROCEDURE

1. Ask children how they think this street looked at the time of early Indians. Help them to realize that there were forests, wild animals, rich soil where their school is now.

2. Ask children what they think their houses are made of and where these materials came from. Could Indians have had these materials at that time? What was available to them to use for building shelters?

3. View filmstrip, Eastern Woodland Indians - Shelter Encourage children to describe what they see and help them to appreciate that the Indians made use of what was around them.

   Activity: Invite suggestions from children about how they might construct a small wigwam using school supplies. Allow children who have ideas to tell the class under them. Encourage them to write their directions down. For children who would like to make wigwams and don't have ideas of their own, show them a sample and post the printed directions in the art area. Read and discuss the procedure. Begin project with them.

   (Correlated with Art and Language Arts and Math).

DIRECTIONS FOR MAKING WIGWAM

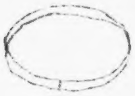
1. Cut from black construction paper 4 strips 1/4 inch wide and 12 inches long (to represent saplings used by Indians)

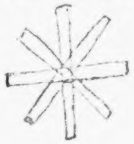
   Cut 1 strip 1/4 inch wide and 18 inches long.

2. Glue the ends of the longest strip together to form a ring.

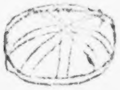
3. Fold each 12-inch strip in half to find the center and open again.

4. Lay the strips in this pattern with centers on top of each other.





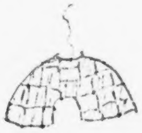
5. Glue ends to inside of ring.



6. Cut as many 1-inch squares out of brown wrapping paper as needed to cover wigwam. With black crayon make lines on each square to make it resemble bark.

7. Glue squares in an overlapping pattern to cover framework.

8. Cut a door and a round smoke hole in the top.



APPENDIX A-5

MATH LESSON PLAN

OBJECTIVE

Each child will determine how many tens and how many ones in numbers from 11 to 20.

EVALUATION TECHNIQUE AND ACCEPTANCE CRITERIA WORKSHEET

Ten problems out of ten solved correctly.

MATERIALS

Set of ten (sticks); sticks; rubber bands; flash cards for digits 0-9 (two for digit 1); flash cards for "ones" and "tens"; six styrofoam tens trays (meat trays with nine holes the size of a set of ten); six styrofoam ones trays; six worksheets; tens | ones written on the board near chalk tray.

PROCEDURE

	Purpose
A. Introduction	
Children will identify digits, set of ten, set of one, "ones," "tens," that lie on table.	Review
B. Main Lesson	
1. Each child selects ten sticks and places them in appropriate tray.	1. To discover nine sticks all fit in ones place.
2. A child selects digit card to represent nine sticks and places it on chalk tray under (tens or) ones place.	2. To record concrete discovery abstractly.

3. Repeat steps numbers 1 and 2 with ten sticks.	3. To discover ten sticks must be bundled and that ten sticks are one ten and zero ones.
4. Repeat procedure with 11, 12, 13, and as many numbers to 20 as needed. Each child proceeds at own rate and may stop when he says how many tens and ones in a number without counting sticks.	4. To fulfill objective.
C. Closing	
Worksheet	1. Relate concrete discoveries to abstract notation. 2. Evaluation technique

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APPENDIX B

B-1

OBSERVED MEAN SCORES OBTAINED ON SEVEN COVARIATES BY SCHOOL BY TEACHER AT KINDERGARTEN

School-Teacher	N	Stanford Early School Achievement Test				Chrono-logical Age	Self-Concept Rating	Mobility
		Environ-ment	Mathe-matics	Letters and Sounds	Aural Compre-hension			
Control	37	21.13	10.89	9.32	12.33	73.86	2.84	1.07
Teacher A	17	19.77	11.07	10.50	13.08	75.17	2.87	1.07
Teacher B	20	22.48	10.72	8.14	11.57	72.55	2.82	1.07
Follow-Through	76	21.44	10.78	10.07	12.88	73.13	2.92	1.25
Teacher C	38	21.08	10.44	11.12	11.78	74.08	2.75	1.13
Teacher D	38	21.80	11.12	9.02	13.99	73.38	3.11	1.36

B-2

OBSERVED MEAN SCORES ON SEVEN COVARIATES BY SCHOOL X PRESCHOOL EXPERIENCE INTERACTION EFFECTS

Independent Variable	Control		Follow-Through	
	No Preschool	Preschool	No Preschool	Preschool
SESAT Environment	19.52	22.74	21.68	21.20
SESAT Mathematics	10.05	11.74	9.50	11.61
SESAT Letters and Sounds	8.19	10.46	10.13	10.01
SESAT Aural Comprehension	11.00	13.65	12.79	12.97
Chronological Age	72.56	75.15	71.03	70.43
Self-Concept Rating	2.69	3.00	2.99	2.86
Mobility	1.00	1.14	1.18	3.66

OBSERVED MEAN SCORES ON 12 DEPENDENT VARIABLES BY SCHOOL BY TEACHER BY PRESCHOOL EXPERIENCE

Dependent Variable	Control School	Control Teachers		Follow-Through School	Follow-Through Teachers		Preschool	
		A	B		C	D	Without	With
MRT								
Word Meaning	7.52	5.20	9.82	8.62	10.36	6.89	8.24	7.90
Listening	9.07	7.82	10.33	11.71	12.24	11.17	10.51	10.26
Matching	9.11	10.56	7.65	9.65	10.46	8.84	8.51	10.25
Alphabet	12.54	12.01	13.07	13.36	13.86	12.85	12.50	13.40
Numbers	11.35	11.06	11.64	12.63	12.61	12.65	11.76	12.22
Copying	5.48	6.01	4.94	6.07	6.10	6.05	5.84	5.71
SESAT								
Environment	28.14	25.58	30.70	28.14	28.20	28.08	27.81	28.47
Mathematics	16.36	16.38	16.34	16.94	17.33	16.55	16.05	17.25
Letters and Sounds	18.41	18.65	18.18	17.62	17.65	17.60	17.30	18.73
Aural Comprehension	15.82	15.70	15.94	17.94	17.39	18.49	16.54	17.12
Attendance	167.00	167.60	166.50	159.20	160.60	157.80	159.60	166.70
Self-Concept Rating	2.99	3.00	2.98	3.76	3.93	3.60	3.42	3.32

B-4

OBSERVED MEAN SCORES FOR FOUR COVARIATES BY SCHOOL X TEACHER AT FIRST GRADE

School-Teacher	N	Metropolitan Readiness Tests	Self-Concept Rating (Pre)	Chronological Age	Mobility
Control 1	97	56.18	3.11	85.94	1.61
A	30	53.85	2.99	84.67	1.63
B	25	62.00	3.14	87.41	1.47
C	16	42.54	2.67	87.27	1.91
D	26	66.34	3.63	84.44	1.45
Control 2	64	56.93	3.13	84.97	1.54
E	32	68.90	3.02	86.64	1.56
F	32	52.94	3.16	84.41	1.54
Follow-Through	97	62.50	2.91	86.10	1.42
G	23	61.59	2.91	85.21	1.58
H	24	66.85	3.12	85.75	1.29
I	25	65.16	2.49	87.04	1.38
J	25	56.40	3.11	86.40	1.42

B-5

OBSERVED MEAN SCORES AND GRADE EQUIVALENT UNITS FOR SIX DEPENDENT VARIABLES BY SCHOOL X TEACHER AT FIRST GRADE

School-Teacher	Stanford Primary I (X)								Self-Concept Rating	Attendance
	Paragraph Meaning		Word Reading		Vocabulary		Computations			
	Raw Score	Grade Equivalent	Raw Score	Grade Equivalent	Raw Score	Grade Equivalent	Raw Score	Grade Equivalent		
Control 1	13.73	1.6	18.95	1.7	18.33	1.7	27.59	1.6	3.19	165.50
A	9.39	1.4	14.81	1.5	13.61	1.4	22.43	1.4	2.72	161.80
B	12.20	1.5	19.51	1.7	18.17	1.7	22.41	1.4	3.13	167.90
C	19.48	1.7	22.45	1.8	20.01	1.9	28.10	1.6	3.43	162.20
D	13.86	1.6	19.02	1.7	21.53	2.1	37.43	1.8	3.46	170.10
Control 2	15.35	1.6	17.67	1.7	14.28	1.4	23.52	1.5	3.42	162.50
E	13.98	1.6	17.35	1.6	15.74	1.5	21.63	1.4	2.87	163.40
F	15.80	1.6	17.77	1.7	13.79	1.4	24.14	1.5	3.61	162.20
Follow-Through	18.24	1.7	19.98	1.7	15.62	1.5	34.25	1.7	3.22	164.70
G	20.01	1.7	21.69	1.8	15.05	1.5	36.01	1.8	2.91	161.50
H	24.74	1.9	24.37	1.9	16.06	1.5	31.04	1.6	3.22	163.80
I	16.69	1.7	15.73	1.6	15.16	1.5	43.72	2.1	3.44	169.10
J	11.54	1.5	18.11	1.7	16.20	1.5	26.64	1.6	3.31	164.60

B-6

OBSERVED MEAN RAW SCORES AND GRADE EQUIVALENT UNITS FOR FIVE COVARIATES (STANFORD PRIMARY I, FORM W SUBTESTS) AT SECOND GRADE IN OCTOBER 1971

School-Teacher	N	Stanford Primary I (W)								Self-Concept Rating
		Paragraph Meaning		Word Reading		Vocabulary		Computations		
		Raw Score	Grade Equivalent	Raw Score	Grade Equivalent	Raw Score	Grade Equivalent	Raw Score	Grade Equivalent	
Control School	55	16.27	1.6	18.59	1.7	19.08	1.6	33.86	1.7	2.87
A	22	16.72	1.7	20.17	1.7	18.25	1.6	31.30	1.7	3.08
B	20	16.43	1.6	19.35	1.7	16.96	1.5	36.13	1.8	2.91
C	13	15.96	1.6	17.41	1.6	20.55	1.8	34.00	1.7	2.75
Follow-Through School	89	13.16	1.6	14.69	1.5	17.72	1.5	30.63	1.7	3.02
D	21	13.00	1.6	12.68	1.4	17.01	1.5	30.87	1.7	3.22
E	22	11.33	1.5	15.06	1.5	18.23	1.5	28.16	1.6	2.85
F	27	11.81	1.6	12.89	1.4	18.83	1.9	31.82	1.7	3.23
G	19	16.48	1.6	18.14	1.7	16.80	1.5	31.67	1.7	2.74

B-7

OBSERVED MEAN SCORES AND GRADE EQUIVALENT UNITS FOR SEVEN DEPENDENT VARIABLES BY SCHOOL X TEACHER AT SECOND GRADE

	Stanford Primary II (X)											
	Paragraph Meaning		Word Meaning		Language		Computations		Concepts			
School-Teacher	Raw Score	Grade Equivalent	Raw Score	Grade Equivalent	Raw Score	Grade Equivalent	Raw Score	Grade Equivalent	Raw Score	Grade Equivalent	Self-Concept Rating	Attendance
Control School	22.28	2.4	14.14	2.5	28.29	2.2	19.05	2.6	1[illegible].97	2.5	3.45	170.60
A	28.98	2.7	17.77	2.8	31.30	2.4	18.95	2.6	18.10	2.7	3.69	168.80
B	19.42	2.1	12.38	2.1	28.29	2.2	17.65	2.5	13.23	2.3	3.81	173.20
C	20.36	2.2	13.21	2.3	26.78	2.2	19.81	2.6	14.28	2.4	3.16	170.20
Follow-Through School	16.11	1.9	11.46	2.0	25.84	2.1	15.93	2.3	13.41	2.3	3.25	163.70
D	15.38	1.9	6.98	1.7	26.74	2.2	13.90	2.1	11.18	2.1	3.21	155.10
E	13.88	1.8	14.78	2.6	25.50	2.1	14.68	2.2	13.57	2.4	3.08	167.70
F	17.96	2.0	11.23	2.0	27.18	2.2	16.41	2.3	12.25	2.2	3.30	166.70
G	17.21	2.0	12.84	2.3	23.92	2.0	18.71	2.6	16.04	2.6	3.42	165.40

B-8

OBSERVED MEAN SCORES ON FIVE INDEPENDENT VARIABLES BY PRESCHOOL EXPERIENCE BY ECONOMIC STATUS* AT SECOND GRADE

Independent Variable	Preschool Experience		Economic Status	
	No Preschool **	Preschool **	Non-Poor ***	Poor ***
Stanford Primary I Paragraph Meaning	12.91 (1.6)	16.51 (1.7)	16.30 (1.6)	13.12 (1.6)
Stanford Primary I Word Reading	15.20 (1.5)	18.07 (1.7)	17.85 (1.7)	15.43 (1.5)
Stanford Primary I Vocabulary	16.84 (1.6)	19.95 (1.9)	18.04 (1.7)	18.76 (1.8)
Stanford Primary I Computation	28.46 (1.6)	36.03 (1.8)	31.98 (1.7)	32.51 (1.7)
Self-Concept Rating	2.74	3.16	2.92	2.98

* Grade Equivalent score in parenthesis.

** No Preschool - 85
Preschool - 62

*** Non-Poor - 39
Poor -108

B-9

OBSERVED MEAN SCORES ON SEVEN DEPENDENT VARIABLES BY PRESCHOOL EXPERIENCE BY ECONOMIC STATUS AT SECOND GRADE

Dependent Variable	Preschool Experience		Economic Status	
	No Preschool	Preschool	Non-Poor	Poor
Stanford Primary II Paragraph Meaning	16.93 (1.9)	21.46 (2.3)	19.67 (2.2)	18.72 (2.1)
Stanford Primary II Word Meaning	11.85 (2.1)	13.75 (2.5)	13.53 (2.5)	12.07 (2.1)
Stanford Primary II Language	26.44 (2.1)	27.69 (2.2)	26.53 (2.2)	27.59 (2.2)
Stanford Primary II Computation	17.81 (2.5)	17.17 (2.4)	16.86 (2.3)	18.12 (2.5)
Stanford Primary II Concepts	12.41 (2.2)	15.97 (2.6)	15.30 (2.5)	13.08 (2.3)
Self-Concept Rating	3.24	3.47	3.39	3.32
Attendance	166.00	168.30	166.50	167.30

B-10

OBSERVED MEAN SCORES ON SEVEN INDEPENDENT VARIABLES FOR FOLLOW-UP OF SECOND GRADE FOLLOW-THROUGH PUPILS

Factor	Level	Stanford Primary I				PLR	Metro. Readi. Tests Total Score	Mobility
		Paragraph Meaning	Word Reading	Vocabulary	Arithmetic			
Treatment								
	Control	6.72	7.41	12.51	13.89	103.60	58.77	1.18
	Follow-Through	10.60	10.53	12.33	12.21	97.45	57.14	1.65
Preschool								
	No Preschool	11.00	9.87	12.51	12.03	95.80	52.84	1.61
	Preschool	9.02	9.77	12.15	13.68	103.10	63.50	1.34
Econo. Stat.								
	Non-Poor	8.04	8.68	12.59	12.73	101.00	56.02	1.61
	Poor	9.29	9.25	12.24	13.37	100.10	59.89	1.23
Sex								
	Girl	8.11	8.52	12.10	12.60	102.50	58.92	1.39
	Boy	9.22	9.41	12.74	13.50	98.59	56.99	1.45

B-11

OBSERVED MEAN SCORES BY DEPENDENT VARIABLE IN FOLLOW-UP OF SECOND GRADE FOLLOW-THROUGH PUPILS OVER A TWO-YEAR PERIOD

Factor	Level	N	Stanford Primary *,**								
			Paragraph Meaning		Word Reading		Vocabu-lary I	Lang-uage II	Arith-metic I	Compu-tation II	Con-cents II
			5/71	5/72	5/71	5/72	5/71	5/72	5/71	5/72	5/72
Treat-ment	Control	29	16.78 (1.7)	24.51 (2.5)	24.41 (1.9)	15.56 (2.7)	16.39 (1.4)	27.72 (2.2)	32.00 (1.7)	17.94 (2.5)	15.49 (2.5)
	Follow-Through	92	12.33 (1.6)	15.71 (1.9)	14.54 (1.5)	11.47 (2.0)	15.03 (1.4)	26.12 (2.1)	31.07 (1.7)	15.51 (2.3)	12.76 (2.3)
Pre-school	No Preschool	74	11.62 (1.6)	16.77 (2.0)	14.77 (1.5)	11.27 (2.0)	14.43 (1.3)	25.66 (2.1)	30.99 (1.7)	17.15 (2.4)	11.84 (2.2)
	Preschool	47	15.30 (1.6)	19.04 (2.1)	19.43 (1.7)	13.32 (2.3)	16.11 (1.4)	27.38 (2.2)	33.96 (1.7)	16.85 (2.4)	14.36 (2.4)
Eco-nomic	Non-Poor	34	14.67 (1.6)	20.49 (2.2)	19.91 (1.7)	14.37 (2.5)	15.98 (1.4)	26.74 (2.2)	29.82 (1.6)	15.43 (2.2)	14.84 (2.5)
	Poor	87	14.43 (1.6)	19.73 (2.2)	19.05 (1.7)	12.66 (2.1)	15.45 (1.4)	27.11 (2.2)	33.26 (1.7)	18.02 (2.5)	13.41 (2.3)
Sex	Girl	68	14.83 (1.6)	20.27 (2.2)	19.92 (1.7)	14.70 (2.6)	15.40 (1.4)	26.50 (2.2)	31.48 (1.7)	18.19 (2.5)	14.62 (2.5)
	Boy	53	14.27 (1.6)	19.94 (2.2)	19.03 (1.7)	12.33 (2.1)	16.02 (1.4)	27.35 (2.2)	31.59 (1.7)	15.25 (2.2)	13.64 (2.4)

* First analysis run in May 1971 consisted of Stanford I (W) subtests; second analysis run in May 1972 consisted of Stanford II (X) subtests.

** Grade Equivalent scores in parenthesis.

OBSERVED MEAN RAW SCORES AND GRADE EQUIVALENT UNITS FOR FIVE COVARIATES (STANFORD PRIMARY II, FORM X SUBTESTS) AT THIRD GRADE IN OCTOBER 1971

School-Teacher	N	Paragraph Meaning		Word Meaning		Language		Computations		Concepts	
		Raw Score	Grade Equivalent	Raw Score	Grade Equivalent	Raw Score	Grade Equivalent	Raw Score	Grade Equivalent	Raw Score	Grade Equivalent
Control School	87	19.64	2.2	13.37	2.3	27.62	2.2	17.64	2.5	14.97	2.5
A	27	19.94	2.2	12.90	2.3	28.90	2.3	18.91	2.6	17.69	2.7
B	29	21.12	2.3	14.06	2.5	29.51	2.4	19.21	2.6	15.18	2.5
C	31	18.75	2.1	13.25	2.3	26.04	2.1	16.22	2.3	13.50	2.4
Follow-Through School	97	15.21	1.9	9.48	1.8	27.77	2.2	12.75	2.3	13.04	2.3
D	23	13.82	1.8	8.99	1.8	30.07	2.4	11.36	1.9	11.83	2.2
E	27	19.92	2.2	13.32	2.3	27.48	2.2	17.42	2.4	17.87	2.7
F	23	14.21	1.8	7.99	1.8	27.87	2.2	11.02	1.9	12.60	2.3
G	24	12.88	1.8	7.62	1.8	25.68	2.1	11.19	1.9	9.85	1.9

OBSERVED MEAN RAW SCORES FOR FIVE COVARIATES (SELF-CONCEPT RATING, PLR, METROPOLITAN READINESS TESTS, CHRONOLOGICAL AGE, AND MOBILITY) AT THIRD GRADE IN OCTOBER 1971

School-Teacher	Self-Concept Rating	PLR	Metropolitan Readiness Tests	Chronological Age	Mobility
Control School	2.94	92.04	57.51	110.90	1.96
A	2.99	97.70	59.97	111.40	2.45
B	3.14	97.69	63.48	109.30	1.53
C	2.88	86.37	53.29	111.50	1.94
Follow-Through School	3.36	95.62	50.59	111.90	1.94
D	2.79	92.75	49.49	110.70	1.39
E	3.55	107.60	52.17	113.20	2.09
F	3.18	89.54	51.77	111.70	2.33
G	3.93	92.57	48.95	112.00	1.96

OBSERVED MEAN RAW SCORES BY DEPENDENT VARIABLE BY SCHOOL BY TEACHER AT THIRD GRADE

School-Teacher	Stanford Primary II (W)										Self-Concept Rating	Attendance
	Paragraph Meaning		Word Meaning		Language		Computations		Concepts			
	Raw Score	Grade Equivalent	Raw Score	Grade Equivalent	Raw Score	Grade Equivalent	Raw Score	Grade Equivalent	Raw Score	Grade Equivalent		
Control School	31.91	2.9	17.31	2.7	33.50	2.7	30.86	3.5	19.87	3.0	3.07	165.90
A	29.64	2.8	19.02	2.9	32.76	2.6	34.40	3.7	20.70	3.1	3.39	166.40
B	33.57	3.0	20.24	3.0	39.87	3.2	35.66	3.8	29.51	4.3	2.85	163.20
C	30.58	2.9	14.98	2.6	30.68	2.5	26.69	3.1	18.69	2.9	3.02	167.10
Follow-Through School	23.61	2.4	15.97	2.7	31.86	2.5	25.84	3.0	18.02	2.8	3.09	165.70
D	20.11	2.1	15.66	2.7	31.67	2.5	23.16	2.9	16.71	2.7	2.81	162.40
E	29.62	2.8	20.65	3.1	35.54	2.9	29.87	3.4	22.98	3.2	3.23	165.20
F	21.73	2.3	17.42	2.7	28.25	2.2	19.00	2.7	15.19	2.6	2.95	166.10
G	23.00	2.4	13.16	2.3	31.99	2.5	28.93	3.3	17.22	2.7	3.36	160.10

B-15

OBSERVED MEAN SCORES ON EIGHT INDEPENDENT VARIABLES IN FOLLOW-UP OF THIRD GRADE FOLLOW-THROUGH PUPILS

Factor	Level	Stanford Primary I				PLR	Metro. Readi. Tests Total Score	Chronological Age (Months)	Mobility
		Paragraph Meaning	Word Reading	Language	Computation				
Treatment	Control	12.20	8.32	24.26	7.82	98.86	62.37	109.00	1.80
	Follow-Through	11.16	8.17	22.83	3.93	91.29	48.37	110.90	1.21
Preschool	No Preschool	11.40	8.77	22.57	5.06	93.31	52.29	111.20	1.49
	Preschool	12.32	8.32	23.60	6.76	98.84	61.12	107.90	1.64
Econo. Stat.	Non-Poor	12.40	7.59	23.68	7.66	97.21	59.43	108.60	1.59
	Poor	10.96	8.91	23.41	4.10	92.94	51.31	111.30	1.41
Sex	Girl	13.08	9.30	23.02	7.06	98.35	57.50	108.80	1.24
	Boy	10.27	7.20	24.07	4.70	91.80	53.24	111.10	1.76

OBSERVED MEAN SCORES ON STANFORD II SUBTESTS IN FOLLOW-UP OF THIRD GRADE
FOLLOW-THROUGH PUPILS OVER A TWO-YEAR PERIOD*,**

Factor	Level	N	Paragraph Meaning		Word Meaning		Language		Computation		Concepts	
			5/71	5/72	5/71	5/72	5/71	5/72	5/71	5/72	5/71	5/72
Treat-ment	Control	34	20.14 (2.2)	31.64 (2.9)	15.19 (2.6)	19.07 (2.9)	28.02 (2.2)	34.89 (2.8)	22.22 (2.7)	33.64 (3.7)	20.13 (2.8)	21.22 (3.1)
	Follow-Through	26	13.75 (1.8)	20.60 (2.2)	9.14 (1.8)	14.84 (2.6)	26.63 (2.2)	32.98 (2.6)	12.11 (1.9)	22.61 (2.9)	12.94 (2.2)	16.70 (2.7)
Pre-school	No Preschool	35	15.71 (1.9)	25.09 (2.5)	11.89 (2.1)	16.57 (2.7)	15.71 (1.6)	33.37 (2.6)	25.74 (3.0)	27.37 (3.1)	15.57 (2.6)	18.40 (2.8)
	Preschool	25	18.68 (2.1)	28.28 (2.6)	13.36 (2.3)	17.52 (2.8)	18.68 (1.7)	34.04 (2.7)	28.72 (3.2)	29.88 (3.4)	18.32 (2.7)	19.68 (3.0)
Eco-nomic	Non-Poor	25	19.57 (2.2)	28.66 (2.7)	12.83 (2.3)	18.08 (2.8)	28.90 (2.3)	36.16 (2.9)	18.08 (2.5)	30.37 (3.4)	17.65 (2.7)	20.46 (3.0)
	Poor	35	14.32 (1.8)	23.58 (2.4)	11.50 (2.1)	15.81 (2.7)	25.75 (2.1)	31.70 (2.5)	15.25 (2.2)	25.88 (3.0)	15.42 (2.5)	17.46 (2.7)
Sex	Girl	32	18.58 (2.1)	28.22 (2.6)	12.92 (2.3)	18.00 (2.8)	18.58 (1.7)	34.97 (2.8)	18.52 (2.6)	28.83 (3.3)	16.53 (2.6)	17.97 (2.8)
	Boy	28	15.31 (1.9)	24.02 (2.4)	11.41 (2.0)	15.88 (2.7)	15.31 (1.5)	32.89 (2.6)	14.81 (2.2)	27.42 (3.1)	16.54 (2.6)	19.95 (3.0)

* First analysis run in May 1971 consisted of Stanford II (X) subtests; second analysis run in May 1972 consisted of Stanford II (W) subtests.

** Grade Equivalent scores in parenthesis.

OBSERVED MEAN STANDARD SCORES (SS) AND GRADE EQUIVALENT UNITS (GE) ON FIVE COVARIATES BY SCHOOL X TEACHER AT FOURTH GRADE

Control 2	54	340.5	(2.8)	344.1	(2.9)	300.4	(2.6)	346.0	(3.1)	336.2	(2.9)
C	29	365.8	(3.2)	366.1	(3.4)	334.5	(3.3)	364.6	(3.5)	355.8	(3.3)
D	25	315.2	(2.4)	322.1	(2.5)	266.4	(2.0)	327.3	(2.8)	316.6	(2.6)
Follow-Through	61	313.7	(2.4)	305.4	(2.2)	305.7	(2.7)	314.2	(2.5)	302.7	(2.4)
E	30	309.0	(2.3)	298.1	(2.0)	304.8	(2.7)	314.7	(2.5)	297.4	(2.1)
F	31	318.3	(2.4)	312.7	(2.3)	306.5	(2.7)	313.7	(2.5)	307.9	(2.4)

B-18

OBSERVED MEAN SCORES ON FIVE COVARIATES BY SCHOOL BY TEACHER AT FOURTH GRADE

School-Teacher	Stanford Diagnostic (W)*		PLR	Self-Concept Rating	Chronological Age	Mobility
Control 1	28.67	(2.6)	88.27	3.31	126.80	1.81
A	25.76	(2.3)	87.92	3.09	129.10	1.77
B	31.58	(2.8)	88.62	3.53	124.60	1.86
Control 2	31.23	(2.8)	97.47	2.82	125.20	2.62
C	34.78	(3.0)	101.70	3.12	122.70	2.31
D	27.68	(2.4)	93.22	2.53	127.70	2.93
Follow-Through	22.03	(2.2)	94.94	2.47	125.10	2.07
E	21.13	(2.1)	92.49	2.12	128.10	2.02
F	22.93	(2.2)	97.40	2.82	122.10	2.13

* Grade Equivalent score in parenthesis

B-19

OBSERVED MEAN STANDARD SCORES (SS) AND GRADE EQUIVALENT UNITS (GE)
ON SEVEN DEPENDENT VARIABLES BY SCHOOL X TEACHER AT FOURTH GRADE

School-Teacher	CTBS Level I, Form 0										Self-Concept Rating	Attendance
	Comprehension		Vocabulary		Computation		Concepts		Applications			
	SS	GE	SS	GE	SS	GE	SS	GE	SS	GE		
Control 1	370.9	(3.3)	361.3	(3.3)	392.3	(4.6)	388.4	(4.1)	376.5	(3.6)	3.23	172.9
A	330.2	(2.6)	339.7	(2.9)	388.0	(4.4)	380.2	(3.9)	350.8	(3.3)	3.21	172.6
B	411.6	(4.1)	382.9	(3.8)	396.7	(4.7)	396.6	(2.8)	402.2	(4.3)	3.25	173.1
Control 2	401.9	(3.8)	377.9	(3.6)	396.1	(4.7)	400.9	(4.3)	390.5	(4.1)	3.08	170.3
C	434.1	(4.7)	397.9	(4.2)	401.5	(4.7)	414.5	(4.8)	404.5	(4.3)	3.30	169.7
D	369.7	(3.2)	357.8	(3.2)	390.8	(4.6)	387.4	(4.1)	376.4	(3.6)	2.79	170.8
Follow-Through	370.0	(3.3)	349.1	(3.0)	367.1	(4.0)	360.0	(3.3)	358.2	(3.4)	3.15	163.5
E	383.3	(3.5)	351.5	(3.1)	356.8	(3.8)	353.8	(3.2)	351.0	(3.3)	3.15	162.1
F	356.7	(3.1)	346.7	(3.0)	378.3	(4.2)	366.1	(3.5)	365.5	(3.4)	3.16	164.9

APPENDIX C

FOLLOW-THROUGH TEACHERS' RATING SCALE

The following eight categories were selected to represent basic components of the Responsive Classroom Environment principle. Please note the degree of implementation of these components on a seven-point scale by Follow-Through teachers from kindergarten through third grade during the 1971-1972 school year. A rating of seven represents the highest degree of implementation, and a rating of one represents the lowest degree of implementation.

CLASSIFICATION OF ITEMS (3-9)

3. Degree of responsiveness of classroom physical environment.

The following guidelines should help you make your judgments:

Reading Area

Are the books displayed at eye level?

Does it provide a relatively quiet place to read?

Blocks

Are there enough variety of blocks?

Art

Do the classroom walls have displays of pictures, geometric shapes, etc. which will stimulate learning?

Concept Formation Area

Is it visible to everybody?

Dramatic Play Area

It there a definite area set aside for play-acting with props, costumes, puppets, etc.?

Listening Area

Is equipment such as tape-recorder, language master, earphones, etc. used in such a way that it is not distracting to other children in the classroom?

Responsive Toys

Are such toys accessible to children?

4. Degree of teachers' verbal demeaning and threatening behavior.

   "Demeaning" refers to any adult behavior toward a child that is destructive to that child's feelings about himself. Some examples of demeaning statements are comments like these: "Shame on you: you know better than that." "That's not nice." "We don't spit on the floor." "You're not thinking." "You're not listening." Sometimes the tone of the teacher's voice is demeaning. Sarcasm is always demeaning.

   "Threatening" would include statements such as "If you don't behave, you can't go on the field trip." "If you don't finish this, you can't go out for recess."

5. Degree of discovery learning.

   After posing a problem or asking a question, the teacher waits for the child to solve the problem or answer the question. If the child errs or does not answer within a reasonable time, one or more hints are given instead of the solution or answer. After each hint -- which should range from weak to strong -- the teacher waits for the child to respond. Only as a last resort, does she supply the solution or the answer. Some questions might be left unanswered, permitting the child to explore more on his own.

6. Degree of application of strong physical force.

   Taking a child by the hand or arm is not considered to be a strong physical force. It becomes strong if the teacher exerts some force to move the child or shake him. Grabbing or picking up a child to remove him because he is creating a problem is strong physical force.

7. Degree of teacher-dominated classroom teaching-learning activities.

   The teacher allows children to play a role in determining how a game is played or how a toy is used.

   For example, the teacher wants to use blocks to teach longer and longest. The child wants to play higher and highest. The teacher changes to higher and highest. The teacher (or assistant) also answers a child's question, responds to a child's statement, or responds to an action; e.g., by naming colors or shapes as the child takes objects from a box or pile.

   - Responds to a child non-verbally -- Attends to child, listens, nods, smiles, hugs, or laughs in response to his actions.

- Asks relevant questions -- A relevant question is one that is clearly based on the context of what the child is doing. It is a contextual, responsive question. For example:

  "You have a high stack of blocks, Marie. How many blocks are in your stack?"

8. Level of participation in in-service workshop.

   This refers to the degree to which the teacher provided some input into the in-service training.

9. General quality of planning, organization, and integration of Responsive principle into classroom activities.

   Does she usually have a visible schedule or plan? Does she understand the goals for that day or week?

   Does she usually have her equipment and materials ready before the children arrive?

   Does the teacher change the planned activities during the day to better meet the needs of the children or to anticipate problems?

   Is there evidence that the teachers selected some of the materials and activities in the room to reinforce the concepts emphasized in the posted plans?

   Is she providing opportunities for children to discover and explore the concepts? For example, are materials out and available and can a child experiment with them as much as he likes?

   Is there evidence that the teacher makes plans for meeting the needs of individual children?

- Asks relevant questions -- A relevant question is one that is clearly based on the context of what the child is doing. It is a contextual, responsive question. For example:

  "You have a high stack of blocks, Marie. How many blocks are in your stack?"

8. Level of participation in in-service workshop.

   This refers to the degree to which the teacher provided some input into the in-service training.

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   Does she usually have a visible schedule or plan? Does she understand the goals for that day or week?

   Does she usually have her equipment and materials ready before the children arrive?

   Does the teacher change the planned activities during the day to better meet the needs of the children or to anticipate problems?

   Is there evidence that the teachers selected some of the materials and activities in the room to reinforce the concepts emphasized in the posted plans?

   Is she providing opportunities for children to discover and explore the concepts? For example, are materials out and available and can a child experiment with them as much as he likes?

   Is there evidence that the teacher makes plans for meeting the needs of individual children?

TEACHER ______________________

GRADE ____________

BEHAVIOR CATEGORIES

	Rating Scale						
	7	6	5	4	3	2	1
1. Degree of utilization of the Weir (Reading) approach.	___	___	___	___	___	___	___
2. Degree of utilization of the CIC (Math) approach.	___	___	___	___	___	___	___
3. Degree of responsiveness of the physical classroom environment to children's interests and needs.	___	___	___	___	___	___	___
4. Degree of teachers' verbal demeaning or threatening behavior to children to insure control.	___	___	___	___	___	___	___
5. Degree of discovery learning in the classroom.	___	___	___	___	___	___	___
6. Degree of application of use of strong physical force to insure classroom control.	___	___	___	___	___	___	___
7. Degree of child-centered classroom learning experiences.	___	___	___	___	___	___	___
8. Level of teacher's participation in regular in-service sessions.	___	___	___	___	___	___	___
9. General quality of planning, organization, and integration of the Responsive principle in the classroom learning-teaching activities.	___	___	___	___	___	___	___